

American FORESTS

The Magazine of Forests, Soil, Water, Wildlife, and Outdoor Recreation
FEBRUARY 1961 **50 CENTS**



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SEE PAGE 4



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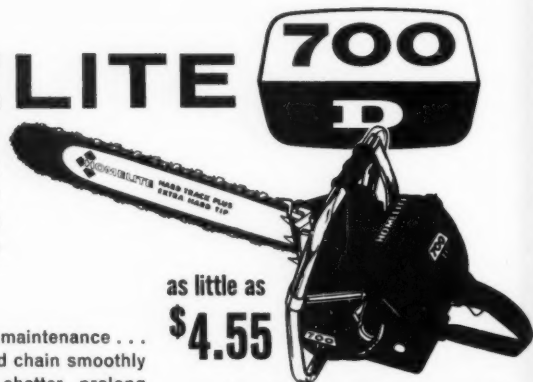
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The American Forestry Association, publishers of American Forests, is a national organization—independent and non-political in character—for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and the part they play in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

James B. Craig

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Vol. 67, No. 2, February, 1961

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COVER • President Dwight D. Eisenhower presents the President's Gold Medal Award for distinguished federal service to Chief Richard E. McArdle, U. S. Forest Service. (See article "Mac Gets A Medal," page 4.) Cover photograph by Vincent Finnigan.

AMERICAN FORESTS is published monthly by The American Forestry Association at 919 Seventeenth Street, N. W., Washington 6, D. C. Subscription price is \$6 a year. Editors are not responsible for loss or injury of manuscripts and photographs while in their possession or in transit. The Editors are not responsible for views expressed in signed articles. Second-class postage paid at Washington, D. C., and at additional mailing offices. Copyright, 1961, by The American Forestry Association.



Forest Forum

"Live and Let Live"

EDITOR:

"And Now, ALUMINUM Christmas Trees!" in your December issue was just read. The part about the lumber industry working together to promote the use of wood was excellent—as long as you are realistic and keep it to legitimate efforts—and face facts from all sides and angles.

But the aluminum Christmas tree bit was too much—and TOO typical of many of you. It is time you—foresters and especially The American Forestry Association—squarely and solidly face up to the fact that this is a 20th Century World. A world of steel, glass, aluminum, etc. . . . and also wood. (I really don't mind if you put the word first as long as you also remember the others. This is also a world of forests, wood production, grass lands and recreation. A world of specialization, where the Jack-of-all-trades does none too well.)

Aluminum Christmas trees? Yes! They sparkle and glisten in a very festive way, as no wood tree ever would unless sprayed. And if sprayed, why wood? The branches of aluminum trees can be crowded or scattered to suit the fancy and ingenuity of each "artist." And there are no gaping holes or imperfections as in the shabby wood trees of today. Their branches are covered with tinsel and leaves, even though artificial. Many of today's real trees are needless by the time they are brought home, let alone set up and trimmed. . . .

Aluminum Christmas trees have the individuality and personality each "creator" gives to them, as do the wood trees. True it is a modern personality but are you so old fashioned and senile that you use the outhouse for its odor and adjust to the cold, heat, flies, hornets, and misshaped

"holes" because you insist on wood rather than modern conveniences?

Furthermore, aluminum Christmas trees are acquired in a legitimate manner. In no way do they result in a barren wasteland that has been cut over by thieves . . . trespassers, and despoilers of the natural areas. AND, for from six to 18 or 20 dollars you acquire something which will last for years, and can even be handed down for generations, as many of us prize our old ornaments. . . .

I too remember with nostalgia the odor, the fresh greenness and beauty of the old fir tree which we went out and cut for ourselves. Cut for size, shape, color, and fancy of our own creative thoughts. But it is a nostalgia for one of those things no longer obtainable. (If I am wrong, then explain why you people are the very ones that will not open your forests for all of us to come in and cut according to our fancy.)

And on this modern vein—why not get out of the old smelly outhouse, out of the horse and buggy, and stop playing the old but serious game of Indians on a lot of other subjects such as the recreation battle. Lets play the diplomatic game of give and take—the honorable game of building governments—rather than the selfish game of bureaucrats and political "havers."

Constructively criticize the National Park Service, or any other recreational organization, for their mis-administration. Help them to build the best of their kind—and you will get reciprocal help in building the best of your kind. Be just as ready to give, to advance others, as you are to hold or take for your own advance. Be sure you are doing the best possible job before you are so ready to say that you are God and can do the best in everything.

And please remember that I am a mem-

ber of your organization. I am so much behind you and believe so strongly in your "purpose" in life that I am saving my pennies so I can become a Life Member so as not to miss your magazine. . . .

I say, "Live and let live." Let's be modern—and that includes change and advance, as well as custom and tradition.

Leroy S. Augden
6147 Sun Court
29 Palms, California

Forestry Does Not Stop At Forest's Edge

EDITOR:

Saying thanks to you seems to be quite a habit but truly a nice one and one that I relish, but I don't know when I have been more pleased with anything in my nearly four years in this industry than I was to read your article regarding the lumber industry in the December issue. I think you can understand my statement much better by reading the copy of the attached release I am sending to our Board of Directors and members of the National Wood Promotion Committee which is a highly specialized list of 200 of the top leaders in the lumber industry.

Your beautiful treatment of the lumber industry's efforts to pull itself up by its own boot straps doesn't go unnoticed and I think it reflects tremendous credit on The American Forestry Association, the magazine, Fred (Mr. Hornaday), Ken (Mr. Pomeroy) and all the others concerned with this type of reporting.

As more and more foresters get interested in the marketing of the raw material they deal with, more and more people will see and understand exactly what you are driving at. I salute you, the lumber industry salutes you, and the forests of America salute you.

Mortimer B. Doyle
Executive Vice President
National Lumber Manufacturers Assn.
1319 Eighteenth St. N.W.
Washington 6, D. C.

EDITOR:

Your editorial "And Now, ALUMINUM Christmas Trees!" is a delightful comment, good reading, and certainly hits the nail on the head.

I am sure that most lumbermen subscribe to your thinking, and the reminder to look at ourselves is indeed good. Beyond that is our second big problem—telling the story of wood.

The industry's attempt to get its head above water through the advertising promotion of the NWPP is one way; and the untiring efforts of men in your category is proving to be another. I, for one, enjoy and appreciate your efforts.

Leonard K. Floan
Vice President, Lumber Division
Potlatch Forests, Inc.
Lewiston, Idaho.

AN ARTICLE IN THE *Wall Street Journal* recently told of the phenomenal growth of the aluminum Christmas tree industry. From almost nothing in 1958 sales surged to a million or so in 1959 and several million in 1960, with plans for making and selling increasingly many millions more in the years ahead. The organized purveyors of the old-fashioned Natural Christmas trees, it is stated, are alarmed over this metallic competition and are making plans to combat it; but the manufacturers of the aluminum trees are confidently predicting that they will soon dominate this attractive seasonal market.

Lumbermen in recent years have grown accustomed to having aluminum and steel vigorously promoted as substitutes for wood in various lines; but this seems to be carrying the substitution idea a little too far. Christmas trees, to be sure, are not a part of the lumber industry's production and

it would have no injurious effect on the lumber business if in the future all the Christmas trees were made of aluminum. We are not actuated by any selfish business interest, therefore, when we express the fervent hope that a gaudy, man-made contraption may never replace the traditional fragrant tree from the woods that so many of us knew in our childhood.

The aluminum product may possess all the qualities claimed for it, but we have a feeling that the American public still retains sufficient sentiment and good taste to continue its preference for the kind of Christmas trees that grow in the woods. The metallurgists can take aluminum foil and shape it into a coldly glittering gimmick which they can label "Christmas tree," but that can't make it a tree. Remember, Joyce Kilmer said: "Only God can make a tree."—From January 1 issue of *Southern Lumberman*.

EDITOR:

Please accept my congratulations and thanks for your very fine editorial "And Now, Aluminum Christmas Trees!" The encouragement given by such articles does much to help us keep the merchandising program sold.

Thanks also for your illustration of the problems with which the industry is faced. This also helps to keep the program sold by making all members of the industry aware of the magnitude of the problem.

Arthur Temple
Southern Pine Lumber Co.
Diboll, Texas.

EDITOR:

I would like to compliment you on your article in the December issue of AMERICAN FORESTS entitled "And Now, ALUMINUM Christmas Trees!" It was excellent and a very fine tribute to the sponsors and contributors to the National Wood Promotion Program now being carried on by the NLMA.

W. R. Garrett
St. Paul & Tacoma Lumber Co.
1220 St. Paul Avenue
Tacoma 1, Washington.

EDITOR:

I just want you to know that I thoroughly enjoyed your editorial in the December issue of AMERICAN FORESTS. I, too, don't go along with aluminum Christmas trees.

William E. Cooper
Executive Director
Virginia Forests Inc.
301 East Franklin St.
Richmond 19, Virginia

"Multiple-use-it-up?"

EDITOR:

"Growing poorer while we are supposed to be getting richer" is the gem in the letter written by Mr. J. Louis Head in the November issue of AMERICAN FORESTS.

Might we say that this is the basic, haunting melody that unnoticed echoes through the halls of the Forest Service but is obscured by the whistling in the dark that serves to pace "conservation in reverse" according to the "multiple-use-it-up" program. "Multiple use" is the all-enveloping cloak that conceals the "wise manipulations" of local administrators, now subject only to their small individual consciences. "Multiple use" is used by the Forest Service like a drunk uses a lamp post for support rather than for illumination.

Hereabouts, local deer shooters (Izaak Walton League) demand the opening of explosive fire closures, in the driest year in history, that are priceless watersheds, in the face of almost unanimous objection of those whose homes and property are endangered thereby, and the Forest Service opens the fire closure!

The pine beetle manifests itself in trees that grow on land from which unnumbered crops of lumber and grazing grasses have been removed over the years, and the Forest Service sprays poison that further reduces the natural enemies of pine beetles, instead of replacing the exhausted minerals in the land!

Ten per cent of the forests of California burned last year. . . Progress, it is wonderful—how about another tranquillizer pill for that hangover?

H. M. Weber, M.D.
Indio, California

(Turn to page 75)

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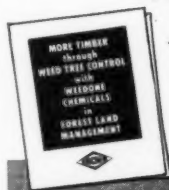
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FOREST Service Chief Richard E. McArdle on Jan. 11 received from former President Eisenhower the nation's top civilian career service award—the coveted President's Gold Medal Award for distinguished federal civilian service. This is probably the highest accolade ever bestowed by a grateful government on the young profession of forestry, and every forester in the nation, federal, state, and private, in a large sense shares in this award.

In a ceremony at the White House, Chief McArdle was publicly commended by former Secretary of Agriculture Ezra Taft Benson, under whom the chief served for eight years. Prior to that Dr. McArdle served as chief under the previous Truman Administration and Former Secretary of Agriculture Brannan.

The citation for Dr. McArdle said that his "imagination, vision and inspiring leadership have brought exceptional progress in the development and protection of vital forest resources for the American people now and for generations to follow."

Accomplishments cited as the basis for the award were: "His dynamic leadership and vision in the development of the nation's forest resources; his wise and effective action in meeting the rapidly-rising public use of the national forests; building and strengthening working relations of the federal government with state governments and private forest industry; for an increasingly effective forest research program nationwide; for leadership in world forestry and the conservation of natural resources which has promoted international co-operation and friendship and reflected credit on the United States; and for typifying the best in civilian career service—integrity, dedication to the public interest, and devotion to the highest ideals of American citizenship."

This award represents the highest commendation a federal career man can receive, and is in turn a tremendous accolade to the 10,000-man career service that Dr. McArdle heads.

FEBRUARY, 1961



At White House ceremony, former President Dwight D. Eisenhower and Forest Service Chief Richard E. McArdle (c.) hear citation read by former Sec. of Agriculture Benson

Photos by Vincent Finnigan

Mac Gets A Medal

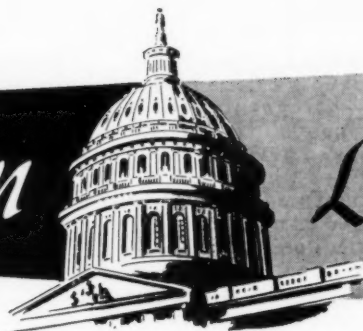


Chief McArdle wears Gold Medal Award as he and Sec. Ezra Taft Benson display McArdle's citation

It was indeed a proud and happy occasion for Mrs. Richard E. McArdle too. Here she reads list of accomplishments that were basis for the award received by her husband



Washington



Lookout

By ALBERT G. HALL

KENNEDY TASK FORCES URGE FEDERAL FORESTRY

expansion. Recommendations to President John F. Kennedy for economic aid to distressed areas, drawn up by a Task Force on Area Redevelopment, and headed by Senator Paul Douglas of Illinois, include, among other things, supplemental appropriations for the Forest Service for increased timber stand improvement, reforestation, road and trail construction, watershed improvement, erosion control, and increased recreational facilities in those national forests in or near areas of economic distress. These temporary measures would be supplemented by long-range programs to increase forest productivity and to enlarge the national forests.

PARKS DEVELOPMENT TO SERVE TOURISM IS ALSO

recommended, by supplementing the National Park Service's Mission 66 Program in distressed areas and by programs to be developed cooperatively by the Park Service and the states to develop recreational facilities on state lands.

SOIL CONSERVATION ACTIVITIES, INCLUDING

reforestation on farms and strip mine spoil areas, and permanent conservation projects in forestry for low-income landowners, using local unemployed persons, with the federal government paying up to 100 per cent of the costs is also proposed by the Douglas task force. This work would be administered by the Soil Conservation Service.

A YOUTH CONSERVATION CORPS, PATTERNED

after the Civilian Conservation Corps of the 1930's and 1940's, is also proposed. It would draw upon locally unemployed and utilize local supervisory personnel in distressed areas to carry on forestry and erosion control projects. In the 86th Congress a bill for the establishment of a Youth Conservation Corps was passed by the Senate, but failed of consideration in the House. A number of similar bills have been introduced in the 87th Congress.

A KENNEDY-JOHNSON NATURAL RESOURCES AD-

visory committee, headed by Representative Frank E. Smith of Mississippi has reported to the new Administration with recommendations that may set the natural resources pattern of the New Frontier. It proposes most of the measures that have been advanced by liberal Congressmen over the past decade. Among other things, it calls for the establishment of a council of resource and conservation advisors in the Office of the President, the end of the "no new starts" policy in regard to water projects, abandonment of the practice of computing taxes foregone as a cost in project evaluation, and inclusion of recreational benefits as project values. A stepped-up program of flood control projects is urged, as is increased reclamation work, with full development of public power, navigation, and recreational opportunities in connection with water projects.

A GOAL OF 2,000 WATERSHED PROJECTS BY 1968

is set by the Smith Report. Early enactment of the Blatnik Pollution Control Bill, vetoed by President Eisenhower last year, and financial aid to communities for sewage treatment are urged.

PASSAGE OF A WILDERNESS PRESERVATION BILL,

purchase of wetlands for wildlife, and additional work in fish production research are also recommended. Expansion of the national park system and public acquisition of shorelines for recreational purposes are reported as critical needs.

EMPLOYMENT OF SEVERAL HUNDREDS OF THOUSANDS

of idle young men on reforestation, soil conservation, park improvement and wildlife refuge work, presumably in a Youth Conservation Corps is part of the program.

FORESTRY IS COVERED IN THE SMITH REPORT AS

a separate item, but practically everything in the report touches on forestry or on the use of forest land. Specifically in the language of the report, ex-

(Continued on next page)

panded federal forestry activities are recommended, as follows: "Increased attention to forestry—our great publicly-owned national forests, the millions of small privately-owned forest tracts, forest research—is one of the most meaningful investments we can make in achieving the economic strength essential to our national goals. If we are to meet our goals in wood fiber requirements in the next 40 years, our total production must be doubled. All forest land ownership, government and private, will demand accelerated attention to meet this need. The greatest opportunity for improvement is on the small, privately-owned, woodland tracts throughout the country, which represent about half of our nation's total forest land. Private credit sources are not available to the average small woodland owner for purchase and development of forested properties.

"EXPANSION AND LIBERALIZATION OF PRESENT

government credit sources, federal and state, tailored to meet the needs of the small owner are needed until ready private credit sources develop. More research is needed to show owners how their forest lands can be better managed.

"THE COOPERATIVE FOREST PROGRAMS CON-

ducted jointly by federal and state groups should receive the funds which have been denied over the past few years. The programs for our national forests badly need acceleration to meet existing needs. Consideration should be given to the possibilities for expansion of the national forest system in depressed areas. Investments in our national forests yield direct returns to the taxpayers, as well as long-range benefits to our overall economy."

KEY POSITIONS IN THE DEPARTMENT OF THE IN-

terior have been filled by President Kennedy. New Undersecretary of the Interior is James K. Carr, chairman of the California Water Commission. Assistant Secretary for Water and Power is Kenneth Holum, a former member of the South Dakota Legislature who has been active as an officer in several telephone and power cooperatives. John A. Carver, Jr. fills a new office as Assistant Secretary for Land Resources, which combines the functions of the former assistants for public land management and for mineral resources. Floyd E. Dominy is retained as Commissioner of Reclamation. New Solicitor is Frank Barry, an Arizona lawyer, formerly chairman of the Arizona Committee on Civil Rights. As American Forests went to press, Secretary Udall

announced that Karl S. Landstrom, career conservationist from Oregon, will replace Edward Woolzey as Director of the Bureau of Land Management.

DEPARTMENT OF AGRICULTURE'S SECRETARIAT

consists of the following: Charles S. Murphy, Under Secretary. Murphy, of Wallace, N.C., was special counsel to President Truman, and has been a counsel to the Senate on agricultural matters. He is remembered by foresters as the man who helped push the "Smokey Bear Law" through Congress. Assistant Secretary for Federal-State Relations is Frank J. Welch, dean of the College of Agriculture, University of Kentucky. Assistant Secretary for Marketing and Foreign Stabilization is John Duncan, Jr., president of the Georgia Farm Bureau Federation. Assistant Secretary for Agricultural Stabilization is James T. Ralph, director of the California State Department of Agriculture. Chairman of the National Agricultural Advisory Committee is Harry Caldwell, master of the North Carolina Grange. The director of legislative service for the National Farmers Union will be named director of the department's agricultural credit services. Administrator of Commodity Stabilization Service will be Horace Godfrey, chief of the North Carolina Agricultural Stabilization and Credit Office.

THE FORESTRY BUDGET FOR FISCAL YEAR 1962,

as submitted by President Eisenhower, doubtless will be altered in some respects by the new Administration. The outgoing Administration proposed substantial increases in funds for Forest Service activities, requesting a total of \$176,764,000, an increase of \$16,127,500 over the funds appropriated for 1961. Principal increase, \$8,527,300 is in funds for national forest management, with reforestation and stand improvement, recreation-public use, and forest protection accounting for half of the additional national forest funds. An additional \$1,500,000 is requested for research, and an additional \$1,600,000 for state and private cooperative programs. Forestry activities of the Department of the Interior and Tennessee Valley Authority are budgeted with minor increases over the 1961 figures.

IN ONE OF HIS LAST OFFICIAL ACTS, INTERIOR

Secretary Seaton presented the Departments Distinguished Service Award to John F. Shanklin in recognition of 27 years of "outstanding service" to the federal government. A career forester, Mr. Shanklin has risen rapidly in the department after entering via the National Park Service.

Editorial — Spotlight On Small Woodlands

THE Washington forestry scene in recent weeks has been chiefly characterized by a new interest in re-examining the opportunities inherent in making the small woodlands of the nation more productive. As Mr. Hall indicates in his report on the preceding pages, the new administration, apparently, is offering its assistance in this area providing foresters can succeed in coming up with workable formulas that can be applied in a practicable manner on the ground.

The Kennedy-Johnson Natural Resources Advisory Committee Report of Jan. 17 has this to say: "If we are to meet our goals in wood fiber requirements in the next 40 years, our total production must be doubled. All forest land ownership, government and private, will demand accelerated attention to meet this need. The greatest opportunity for improvement is on the small, privately-owned tracts throughout the country, which represent about half of our nation's total forest lands. Private credit sources are not available to the average small woodland owner for purchase and development of forest properties. Expansion and liberalization of present government credit sources, federal and state, tailored to meet the needs of the small owner are needed until ready private credit sources develop. More research is needed to show owners how the forest lands can be managed."

Based on our own inquiries, we believe it would probably be a mistake to say that this comprehensive report on the entire resource field, as well as forestry, will represent administration policy, chapter and verse. But it will be a guide and it is correct to say that members of the new administration concerned with forestry are keenly interested in coming to grips with small woodland opportunities if forestry itself can provide the right answers and the right tools. As of now, these leaders are displaying an understandable cautiousness in spelling out just how this work can be accelerated most effectively. However, it is interesting to note that the committee chairman, Rep. Smith, of Mississippi, comes from a state that has only recently launched a new credit program that already seems to be making solid strides.

In another small woodlands development in the Capital, the Brookings Institution on January 18 and 19 was the scene of a well-attended seminar sponsored by Resources for the Future that was keyed by an address by Dean Thorsten Streyffert, of the Royal School of Forestry, Stockholm, Sweden. (See page 16.) Here again the approach to small woodlands in America, at least, was somewhat on the cautious side if not to say restrained. If anyone attended in the hope that the meeting would come whooping out for federal regulation of the type embraced by the Swedes he must have been sorely disappointed.

Based on Dr. Streyffert's talk, the Swedes have certainly made enviable progress in this field. While their Forest Law is chiefly an educational tool, it is nevertheless an ever-present reality, and in a question period Dr. Streyffert was quite emphatic in stating his countrymen did not intend to turn loose of it in a hurry. This law plus the tremendously efficient work of the Swedish forestry cooperatives are largely responsible, apparently, for Swedish success in this field. Another very vital factor is that the Swedes have an unusually well-developed respect

and regard for public servants and appear to believe that the public good comes before the individual right so far as the future tree crop is concerned.

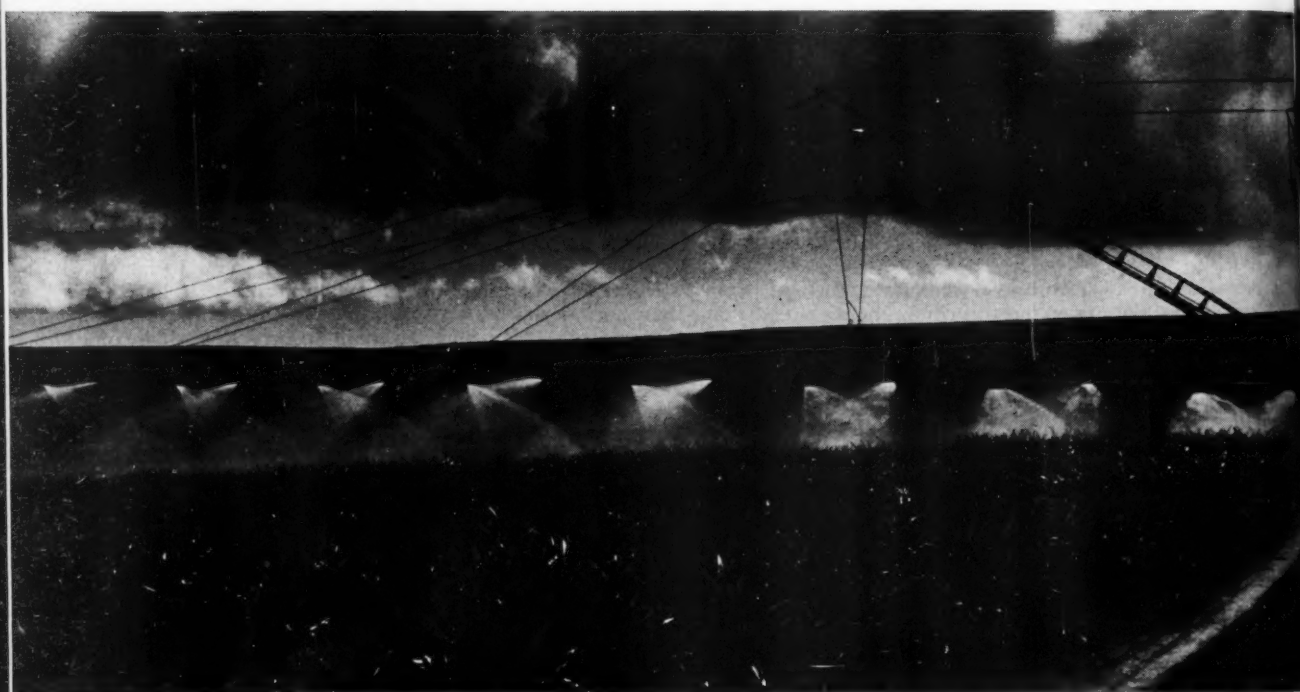
At the same time, it would be a grievous error to automatically assume that "what's good for Swedish forestry is necessarily good for American forestry." As Dr. James G. Yoho, of Duke, stressed as seminar discussant, there are rather basic differences. For example, in Sweden trees are the second largest industry and consequently the well-being of the entire nation depends directly on this great economic crop. Also, the value of forest products exported from Sweden annually varies from one-third to one-half of the value of all exports. The United States, on the other hand, is one of the world's leading importers of such products. And whereas forest-based employment in Sweden is exceeded only by agriculture, in the United States the per cent of the total labor force engaged in forestry and logging runs only about one-third of one per cent nationally and reaches a maximum of only one per cent in one forest region. Agriculture in the United States, on the other hand, can claim about 12 per cent of the nation's total labor force.

Dr. Yoho, who is currently collaborating with AFA Chief Forester Pomeroy on a landownership study in North Carolina, said that the forest, as a source of income to individual owners in Sweden seems to far outweigh that of their American counterpart. It has been authoritatively stated that the forest, including off-farm employment, is often the major source of cash income to Swedish farmers, Dr. Yoho said. On the other hand, the low incomes invariably attributed to their woodlots by American farmers in the Census of Agriculture has long been a matter of common knowledge and concern in forestry circles. Preliminary work in this respect in North Carolina tends to substantiate the Census as the AFA team has seldom encountered a landowner, either farmer or other, who believes that over two per cent of his long-term average annual income could be attributed to forest holdings, Dr. Yoho said. Another important difference is the matter of stability of ownership. The Swedes hold to their land whereas the average length of forest land ownership in America among non-industrial owners ranges from 10 to 15 years.

In brief, there are contrasts as well as similarities between the forest picture in the two countries and it would be a mistake to assume that what is good for one is necessarily good for the other. The goal should be to weigh and choose in terms of what might be best for our own particular needs and always we should avoid the precipitous and reckless word or action.

AMERICAN FORESTS congratulates both Rep. Smith's committee and the Resources for the Future for re-opening discussion in this sometimes controversial field in an intelligent and thoughtful manner. Everyone, we are convinced, wants to see progress here from the industry manager interested in tree crops for the future to the conservationist anxious to relieve existing pressures on public lands. Unfortunately, as a review of past issues of AMERICAN FORESTS readily shows, our approach to small woodlands has often generated more heat than light. In striving for practical answers, we should strive to be thoughtful, objective, and above all good-humored. Recent events lend hope that we may be able to do this.

FOG AND LAVA ROCK, PINES AND



Large machines with 50-foot booms move along roads on Lanai spraying each pineapple plant with a half inch or more of water

NORFOLK Island pine trees (*Araucaria excelsa*), high on the slopes of Lanai's low mountains, squeeze enough moisture out of the swirling fogs to irrigate, during the dry season, the pineapple plants a thousand feet below. Over on the island of Hawaii, in the middle elevations of the Kona district, the Bishop Estate hopes, to accomplish much the same thing only, instead of pineapples, they hope to grow pine trees for lumber.

Lanai, one of the Hawaiian islands, kidney-shaped, 13 miles wide and 18 miles long, is called the "pineapple island." Growing on

15,500 acres, pineapple is Lanai's sole economic crop.

Pineapple, called by some the "king of tropical fruits" grows in semi-tropical, semi-arid areas. From the time the little pineapple slips, suckers, or crowns are thrust into the ground, twenty to twenty-two months roll by before the first fruit can be harvested. The following year another fruit is picked. After this harvest, they plow the pineapple plants under, or break them into mulch, or sometimes burn them. In these much cultivated red-colored, dry, dusty, smooth fields planters again push in thousands of pine-

apple slips, suckers, or crowns. These little plants can survive without water for a very long time, but too long a dry period delays time of harvest, size of fruit, or may even cause the plant to die.

The pineapple fields of Lanai lie in a 20- to 30-inch rainfall belt, yearly average. Normally most of this rain falls in heavy tropical storms, and unfortunately much of it rolls off the land and is lost in the ocean.

Trade winds, 10 to 20 miles an hour, blow over the sun-drenched pineapple fields most of the year. These winds tend to deplete the soil moisture which is needed by the new

By NORMAN K. CARLSON

PINEAPPLES



Aluminum louvre collects water from fog

pineapple plants, and the old ones too. Pineapple crops, in years of good rainfall, are bountiful. Too often, due to inadequate water for the growing plant, the crops have been low in tonnage and poor in quality.

Yet a mile or so from these pineapple fields, 10 to 15 inches of additional rains falls. These lands are not suitable for pineapple because of the cold soils and the lack of sunshine. Under these fog shrouded mountains, 700 or more feet above sea level, there are great storage basins of water; this water has probably been collected through the hun-

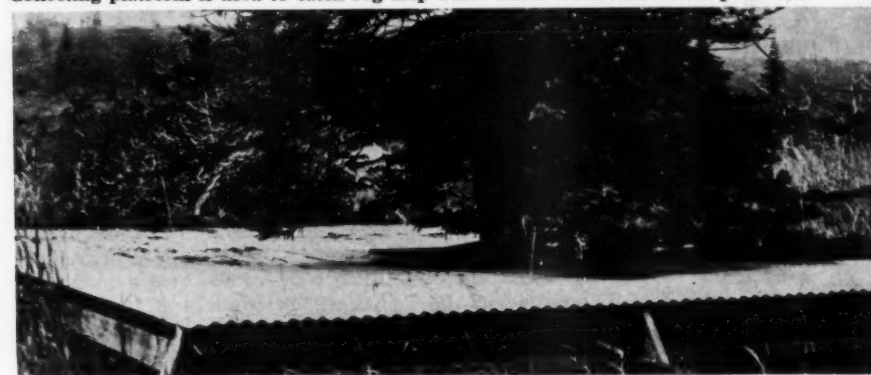


A "harp" with its wind-oriented vane has trough to collect and measure water



In upper elevations in Kona, Island of Hawaii, are rough aa lava fields

Collecting platform is used to catch fog drip water under a Norfolk Island pine tree



dreds of years and is held in place by almost watertight volcanic dikes.

Into these diked basins, the engineers have sunk wells, shafts, and tunnels. From these perched waters they pump up the water and pipe it to the pineapple fields below. Hooking into the water outlets, great machines move along the roads with their 50-foot booms, and spray the thirsty pineapple plants with a half inch or more of water. Costly, yet the returns in more and better fruit and a sure crop have been a benefit to all who live on the island of Lanai.

Two to three months of irrigation,

at 2 to 5 million gallons of water a day, prompted the waterman to raise a question: Are we pumping our underground reservoirs dry or are they being adequately replenished by rainfall? It soon became apparent that rainfall was not of sufficient quantity to recharge the underground basins.

Looking up at the higher lands of Lanai, you can see, almost daily, a heavy cloud enveloping the mountain slopes and peaks. Under the trees and shrubs, in this cloud belt, the ground is usually wet. From this, the scientists of the Hawaiian Pineapple Company, the State of Hawaii



Fog shrouded uplands of Lanai were considered perfect laboratory for demonstration of amount of water that can be collected from clouds and fog. Norfolk Island pine trees used in experiment average 30 years of age, are conspicuous by their height

Board of Agriculture and Forestry, and the Meteorology Department of the Pineapple Research Institute and the Hawaiian Sugar Planter's Association began in 1955 the cooperative study called the "fog drip experiment."

The island of Lanai lies in the trade wind flow downward from the island of Maui and somewhat from the island of Molokai. The lift of the trade wind clouds over the higher elevations of Maui rob these clouds of much of their moisture and consequently rainfall on Lanai is low (37" in the mountains of Lanai compared to 200 to 400 inches in the mountains of west Maui.) After Maui, these clouds of much lessened moisture flow to Lanai and daily envelop the mountains in a rainless fog. Lanai was thus considered a perfect laboratory for a demonstration of the amount of water that can be collected from clouds and fogs. The study began July 1955 and ended three years later, July 1958.

Measuring stations were installed at 2750 feet. In this area, 30-year old Norfolk Island pine trees, 40 to 80

feet high, are wide branched to the ground. Between the wide spaced trees, there were open areas where the scientists could install mechanical fog catchers, and rain gauges.

The mountain soils of Lanai are usually heavy and very acid. In the little depressions water stands for days and can be measured. Winds blow 10 to 12 miles per hour, and sunshine, except for the early morning, is almost non-existent. These Stygian-like lands are not a pleasant place to work; a thousand feet below the sun shines most of the time, converting water and minerals in the pineapple plants to the sweetest of tropical fruits.

The research men installed rain gauges in the open areas and under the trees. They built corrugated iron platforms under the trees and measured the water that dropped from the tree to the platform. They built mechanical fog catchers, called "harps," and measured the intercept from these. A harp is composed of vertical wires which are kept oriented into the wind and the resultant water catch was collected in a stand-

ard 8 inch rain gauge. Fog catchers of aluminum louvers and many other materials were installed from ground height to 30 feet above the ground. Statistical analyses of the various methods were made and studied.

A few notes from the complete report are most interesting:

1. Intensities (fog drip) vary with droplet size, distribution in passing clouds, wind forces, and so forth. The highest intensity of record was 32 gallons of water which were intercepted by a Norfolk Island pine tree in 43 minutes. This gives a rate of water catch of 44.65 gallons of water per hour or 1,072 gallons of water per day. If there were a thousand trees intercepting fog and clouds, this would total about a million gallons of water per day, dropping to the ground and perhaps filtering down to the underground water reservoir.

2. Fog drip water from Norfolk Island pine trees. Eight rain gauges were set at random under one pine tree; average water collected under the tree was 391 inches compared to 149 inches from rain gauges set in the open. A 30-foot-high tree has a vertical silhouette almost equal to its branch horizontal coverage (300 square feet); if this tree collected all the rain and fog drip, some 30 inches of additional water would be gained from cloud intercept. From a horizontal metal platform set under a pine, 20 feet by 36 feet, rain gauges measured 16.19 inches, the watershed measured 15.52 inches, while only 1.16 inches of water fell in the open.

3. Fog drip water collected from a harp. A harp, 37 by 37.5 inches in outside dimensions, with .01 inch diameter vertical copper wires spaced .25 inches apart, was set four feet above the ground and kept oriented into the oncoming clouds. From August 1955 to July 1958, more than 1964 inches of water was collected from this harp, whereas rain gauges in the open measured only 104 inches of rain. The harp was most effective during periods of light rainfall—a unit of vertical interception gave 3 times that of the normal rainfall measured.

4. Various materials were used in fog cloud interception. Louvred aluminum screens proved very effective, and 2 layers set an inch apart was 2.2 times as effective as one layer (1.57 inches as compared to 3.45 inches).

5. Fog drip collected from different heights up to 30 feet above the ground. During one 3-month period, water collected at 30 feet measured

AFPI AWARDS SCHOLARSHIPS TO 4-H CLUB FORESTRY WINNERS



A Paul Bunyan breakfast faced the six national 4-H Forestry winners of \$400 college scholarships provided by the American Forest Products Industries, Inc., at the 39th National 4-H Club Congress.

Named top in the nation in a program involving 78,000 4-H'ers and a quarter-million acres of trees, the winners were honor guests at a loggers breakfast given by the American Forest Products Industries, Inc.

James C. McClellan, chief forester of the sponsoring organization, served "plywood" pancakes topped with "woodyard" eggs to Carolyn Ravenscroft, 16, winner from Tuttle, Idaho. Other winners are (l to r): Front—Roger Sorvari, 17, Toivola, Minn.; Middle—James Fowler, 17, Forest Hills, La.; James Carr, 19, Morris, N. Y.; Back—James Gray, 19, Gloucester, Va.; James Latrip, 17, Pittsboro, Miss. The 4-H Forestry Program is arranged by the National 4-H Service Committee and conducted by the Cooperative Extension Service.

13.3 inches, at 6 feet 2.7 inches, and at ground level, rainfall in the open measured only 1.25 inches.

In summary, Norfolk Island pine trees, on the higher lands of Lanai, lying in the path of high vapor clouds, precipitate an additional 30 inches of rain each year. During periods of light rains, mechanical interceptors such as harps or louvred screens catch a 3-fold volume of water when compared to that caught in rain gauges in the open. If the harp were placed 30 feet above the ground, interception would increase 10-fold.


The mechanical fog catchers are expensive to build and maintain. The Norfolk Island pine tree needs little maintenance after it becomes established. The mechanical device does not need water as does a tree—yet a tree is an efficient fog interceptor, and we should not begrudge the tree its use of water in its life processes.

Measurements were discontinued in August 1958. But the tree planting has not stopped and the pineapple fields are being irrigated from the fogs intercepted by the pines and other vegetation. A gnawing question remains: how many more acres of pineapple can be planted, cared for, and assured continued growth through the use of water collected in Lanai's underground water basins. Engineers continue to measure the underground water outflow and estimate the amount of water remaining.

From the island of Lanai to the west side of the island of Hawaii (Kona district) is about 100 miles. Pineapples are not grown commercially in Kona. Kona's crops are coffee, pasture, timber, and tourists. People like Kona for its climate, history, and the leisurely way things are done. Some of the water for Kona's people comes from a lens of fresh water which lies over the sea water, which if overdrawn by heavy pumping, will become salt saturated. So far this has not been a problem but as the need for water increases, Kona may find itself taxed as was the island of Lanai. A more pressing problem, now, concerns the use of thousands of acres of bare aa land in the fog shrouded uplands of Kona.

Aa is a form of lava. As the molten rock comes from the vent, it rolls down the slopes, composed of countless individual rough-sided fragments. The rain falls on this lava and as the water rapidly filters downward, it coats the rough-sided rocks with a thin film of water. When the

(Turn to page 58)



White-tailed buck has approached a telephoto-equipped camera cautiously and is seen here just at the instant before he leaps away

DURING the past two years a rebellion has hit Wisconsin. This rebellion of which I speak has not been characterized by either violence or turmoil, but by a vocal uprising against traditions. Perhaps the nature of this rebellion can best be exemplified by the following headlines which have appeared in Wisconsin newspapers during the past two years: "Foresters Map Drive to Cut Deer Damage"; "Too Many Deer Hurt Forest Products Industries"; "Foresters Complaints Extend Deer Season"; "Variable Deer Season Favored by Industry"; "Foresters Urge Landowner Role in Deer Control"; "Foresters Seek Liberal Deer Hunt"; "Wisconsin Lumber Firms Invite Hunters on Their Lands to Cut Tree Damage by Deer."

I might add that the report of this rebellion spilled over the state lines, for the last headline appeared in the Midwest edition of the *Wall Street Journal*.

While reading these several headlines from Wisconsin newspapers, you may well gather that the private forest interests in Wisconsin are not entirely happy over the existing forest and deer management situation.

In county surveys, deer were respon 9 p





White-tailed doe rests in the forest

By E. S. HURD

Managing Forester, Consolidated Water Power and Paper Company

Deer Trees and People

The fact is we are not. We believe that the private landowner has not had sufficient opportunity or recourse to express his thoughts and opinions as to what is happening on his own property. The industrial forest owner should have some voice as to the program which affects his properties and to the damages which are of considerable economic importance to the owner.

Although wildlife is the legal property of the state, we find in Wisconsin that the forests which serve as natural deer feeding cafeterias are 60 per cent in private ownership, 21 per cent in county-owned forests, 15 per cent in national forests, and a meager four per cent in state ownership. If this problem of deer browse damage were restricted to public lands then we industrial foresters wouldn't have much to fret about.

The question frequently is asked as to why foresters are becoming so concerned about this problem of deer damage to the forest and whether they are inclined to be making an issue of something that is not too important. To the Sunday motorist, the tourist, and the deer hunter who failed to bag a deer last

season and, for that matter, to anyone who has occasion to drive through or visit in the forest area of Wisconsin, there very likely is to be a question as to the reason for all this fuss about damage that the deer are doing to the forest. Through the eyes of the general public, all seems to be peaceful in the forest. The countryside is clothed in an abundance of greenery and the foliage is lush and plentiful, so why the turmoil and wherein lies the problem?

I believe that the public has a good point in asking such questions and that we foresters have been remiss and have failed to exploit the opportunity to state our case. I would like to relate to you some of the reasons why foresters in Wisconsin are concerned.

In 1958, the Wisconsin Forestry Advisory Committee, which reports to the Conservation Commission, conducted a survey in an attempt to gather facts relating to the problem of how serious deer damage is in Wisconsin forests. From a sample area of 5¼ million acres out of a total 20 million acres in 31 northern and central Wisconsin counties, it was found that deer were responsible

9 per cent of major forest damage

Proper balance between deer populations and carrying capacity of forests is advocated



for 39% of the major forest damage, followed by porcupine, beaver, and rabbits. Such damages are instrumental in causing an unestimated dollar loss to the forest reproduction which is essential in providing replacement forest growing stock.

There are still other reasons as to why the industrial foresters in Wisconsin have become alarmed over these increasing damages which result from excessive deer browse damage to forest reproduction. Not too many years ago, industrial foresters could be classified as either pulpwood or saw log foresters depending, of course, on the products manufactured by their companies. Fortunately, such classifications are now memories. Today, through closer utilization of products and better-integrated forest management

programs, such restricted views do not exist. I can assure you that we in the paper industry have a warm regard toward our company-owned hardwood forests which yield veneer logs with a \$100-\$200 per thousand price tag. As a consequence, this becomes a perplexing problem—are these hardwoods to become expensive deer food?

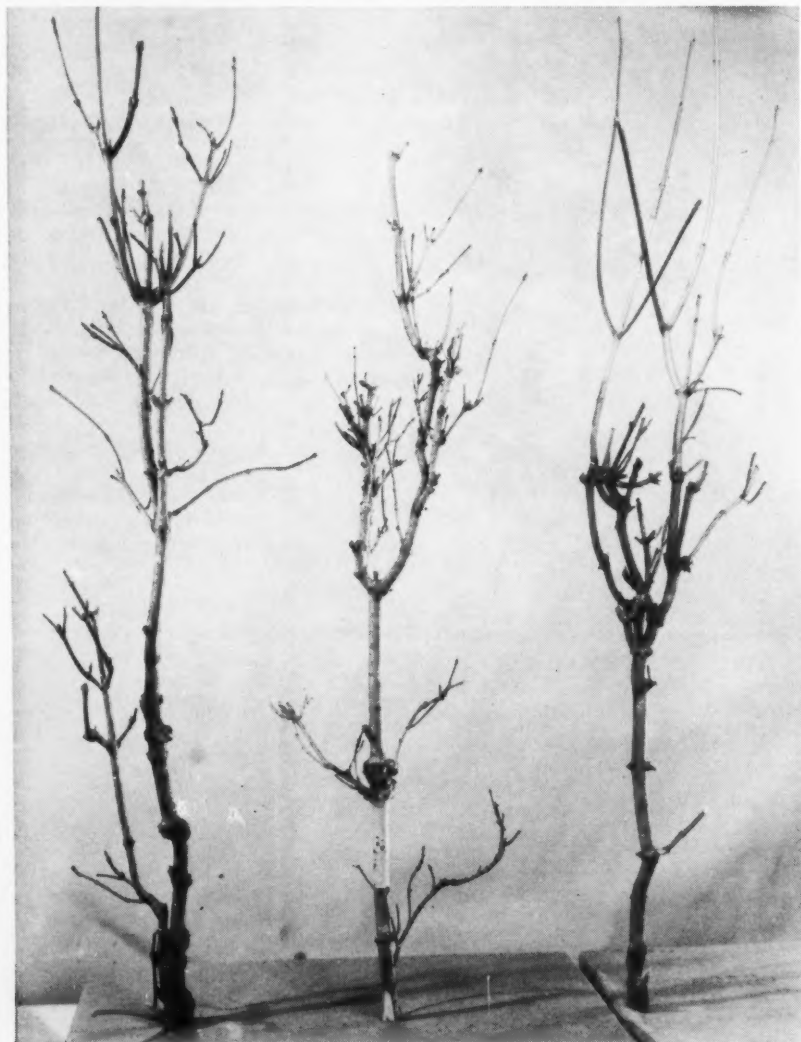
Within the past few years a new break-through in hardwood utilization has created a greater demand for the dense hardwood by the Wisconsin paper industry; the use of dense hardwoods by the Wisconsin mills has increased 41 times in the past 15 years. Without question this new interest being given to this home-grown source of wood fiber has certainly caused the industrial forester, to look with a new interest

toward the management of the hardwood forest and also to the attendant problems arising from excessive damage to hardwood reproduction.

In an effort to express their attitude on the controversial issue of deer vs. forest, the Wisconsin members of the Lake States Council of Industrial Foresters prepared and endorsed a policy statement relating to forest and deer management problems in Wisconsin. The statement was adopted in September 1958. While it is true that this statement contains no earth-shaking proposals, we believe that it has created a much better understanding of what industrial foresters were striving toward. We foresters do not advocate the annihilation of the state deer herd, but we strongly advocate a proper balance

(Turn to page 71)

These stunted hardwoods illustrate serious damage to forest reproduction by excessive deer browsing. Establishment of new forests is hampered by over-population of deer



Stunted by deer browse, tree 2 1/2' tall should have grown to 12-15'





SANTA FE to Host AFA Meeting

SANTA Fe, "The City Different," has been selected as the site for the 86th Annual Meeting of The American Forestry Association, October 1-4, 1961. Residents of this picturesque town have claimed the unique title for their city because they believe there is no other city in the United States to compare with it for romance and history. Visitors to this city are always fascinated by its ancient narrow streets lined with brown adobe houses with their picturesque patios, the towering cottonwoods, the fragrance of piñon smoke, the music of spoken Spanish, and the colorful dress of the Indians from the neighboring pueblos.

The La Fonda Hotel in Santa Fe will serve as headquarters for the meeting, which is under the chairmanship of Regional Forester Fred H. Kennedy, Region III, U. S. Forest Service, of Albuquerque, New Mexico. Mr. Kennedy has planned an extremely interesting program for the annual meeting, based on the theme, "The Stewardship of Our Public Lands." The La Fonda Hotel

is now accepting reservations for the meeting, and all AFA members are urged to plan their trip to arrive in Santa Fe by October 1 in time for the tour of historic Santa Fe.

Most of its historic landmarks are located in a small area surrounding the ancient Plaza, which is still the hub of the city as it has been from the earliest days, although Santa Fe is now a community of 39,000. The Plaza has witnessed the most turbulent and historic scenes of the Southwest. It was the communal Plaza of the Pueblo when the Indians occupied Santa Fe from 1680 to 1692. It was here that the Pueblo Indian tribes capitulated to DeVargas in 1692. With the advent of trade, it was the terminal point of the Old Santa Fe trail, where wagon trainmen disposed of their wares after four months of hardship that side of Independence, Missouri. General Kearny here proclaimed this a territory of the United States in 1846. Later, during the Civil War, it was the scene of Confederate occupancy for a few days. With the coming of

modern commerce, the Plaza has become the focal trade center of the city.

Other tours to be featured at the annual meeting, on October 2 and 3, will include visits to the various operations of the U. S. Forest Service, the National Park Service, the Soil Conservation Service, the Bureau of Land Management, the Corps of Engineers, and the Bureau of Reclamation. Representatives of these cooperating agencies have organized informative tours to show AFA members the management operations now underway on the public lands in the West.

On Wednesday, October 4, an all day field trip to the famous Ghost Ranch has been scheduled. This 25,000-acre ranch, 65 miles northwest of Santa Fe on U. S. Highway 84, near Abiquiu, New Mexico, is the home of the Ghost Ranch Museum. This unique institution was established by the Charles Lathrop Pack Forestry Foundation, at a cost of \$260,000, as a permanent outdoor resource conservation exposition in the Southwest. The museum utilizes natural features and living animals and plants as displays.

The museum is principally devoted to public education in watershed and wildlife conservation. The U. S. Forest Service and the Soil Conservation Service are cooperating in the project. William H. Carr, Foundation vice president, who built the Arizona-Sonora Desert Museum in Tucson, Arizona, also designed the new museum and is its director.

A feature of the exposition is a separate American Beaver Museum, where the animal engineers swim in and out of a large display structure. This building also contains beaver art and history sections. One of the museum beavers actually has a hole in his head through which air escapes when he is submerged. Otherwise he is perfectly healthy. This unique animal is named "Slap Happy."

Other living mammals of the region on exhibit include mountain lions, bears, prairie dogs, and many others. Living birds and reptiles are also displayed, and there is an exhibit of local dinosaurs in the main museum. The ranch is distinguished as a dinosaur burial place.

The museum was built in this untenanted but well-visited region to inform the American people about their own country, of its vanishing wildlife, grass, water, soil, its wonders of life, past and present, and rehabilitation possibilities for the land in the future.

The auditorium at the Brookings Institution was well-filled on January 18 for the lecture by Dean Thorsten Streyffert, of the Royal School of Forestry, Stockholm, Sweden, who discussed "Management of Small Forest Holdings in Sweden." The presentation marked the second in the current series being sponsored by Resources for the Future, Inc. The speaker, right, singled out former Asst. Forest Service Chief Ray Marsh for a special accolade, stating that the American's study of Swedish forestry was the finest ever made up to the present time.



Dean Thorsten Streyffert

MANAGEMENT OF SMALL WOODLOTS IN SWEDEN

By THORSTEN STREYFFERT

THE management of small forest holdings admittedly presents a problem in a number of countries, each with quite varying natural and economic conditions for forestry. This seems to indicate that there is a certain correlation between the size of forest holdings and the management attained. However, a closer scrutiny of this question will reveal that it is more complex. The human factor is more or less involved, especially in the case of small forest hold-

ings. In most countries the small forest holdings are, to a considerable extent, integrated with farming, which has an impact on the management of the forest lands. Thus the condition of the farm woodlots arises which proves to be an essential component of the problem to be treated today. This aspect of the management of small forest holdings is quite outstanding in Sweden.

From what is known of the management of small forest holdings in

other countries, it would seem that this problem has been solved somewhat better in Sweden than in most countries. As a matter of fact, a recent investigation based on the last national forest inventory gave the result that there is no great difference in the management of the forests belonging to the principal categories of owners, viz., the government, the lumber and pulp companies, and private owners. The last group is dominated by the farmers and thus represents the small forest holdings as compared with the big holdings belonging to the former ownership groups. The qualities investigated were volume of growing stock and yearly growth per acre, distribution of growing stock between diameter classes, the quality of trees, the extent of reforestation, of thinnings and of non-commercial cleaning in the youngest stands, all considered according to differences in site class and other relevant factors relating to the forest property belonging to the different owner groups.

As a matter of fact, the result of this investigation was somewhat surprising to many in Sweden, as the general opinion had been that although the management of the small forest holdings under the guidance of several agencies has been constantly improving since the turn of this century, yet the management of the big forest holdings has also been greatly improved during the same period. Although this investigation is not the final answer to the very complicated question of comparing forest management as practiced by owners on big and small holdings, it provides a reason to try and analyze the influences governing such a development in order to explain, if possible, why Sweden seems to differ from most other countries in this respect. On the other hand, it must be observed that the interplay of a given set of agencies will give different results in different environments, especially in consideration of the great importance of the human factor, of tradition and of the general place of forestry in the national economy and in the economy of the forest owner.

An Analysis of the Small Forest Holdings

A first step in the analyzing of this problem should be to try and define more precisely why the management of small forest holdings in most countries is not as good as that of the big holdings.

A precise assessment of the significance of the size of holdings to the efficiency of management is difficult to make, not only in Sweden but in most countries, since forestry on the smaller holdings is generally integrated with farming, whereas the larger holdings are, in most cases, either integrated with forest industries or else owned by the state or other public bodies. The influence of the size of the holding on the forest yield and on the economic outcome of forestry cannot, therefore, be distinguished from the influence of ownership. Discussion of the influence of the size of holdings must for this reason, but also for practical reasons, include the influence of ownership with special reference to the integration of forestry with other economic activities.

However, it is possible to make a distinction between the influence of the size of the holding and the type of ownership. By closer scrutiny of the problem it can be stated that the size of holding has a bearing primarily on the efficiency of the management, whereas the ownership largely reflects the forest policy of the owner, or at least his general attitude in regard to the management of his forest property, in as much as this is a part of his total property, and thus should be geared to his enterprise as a whole. Concerning the forest property this is of vital importance, since it will largely determine his policy toward investments in forestry.

In regard to the influence of the size of holding, it is generally conceded in Sweden that the principal drawbacks of the small holdings are the following:

- Trained personnel and skilled labor cannot be employed except by the agency of public authorities or by co-operation between the forest owners.
- Mechanization is difficult to apply economically on small forest holdings, especially the use of more expensive kinds of machinery.
- Scarcity of capital.
- The small forest holdings are not keeping up with the results of research and technical developments in forestry.
- The smallest woodlots and those of an unsuitable form—long and narrow strips—are a hindrance to practicing sound silviculture.

These drawbacks are probably of a universal nature and not simply a characteristic of Swedish conditions.



Time is the vital factor if we are going to get 4½ million small forest holdings in America under intensive management, Forest Service Chief R. E. McArdle (above, at podium) told audience. About 50 billion board feet, or nearly half of the total growth needed to meet future timber demands, must come from small holdings, the chief said. To get the job done in the next two decades will require reforestation at 3½ times the current annual rate; timber stand improvement at 9 times the current rate; a more rapid shift from low-standard cutting to improved harvesting practices; and at least a one-half reduction in losses still being sustained from fire, insects, disease, and other destructive agents. With Chief McArdle on platform are (l to r) Dr. James G. Yoho, of Duke University; Dr. Joseph L. Fisher, president, Resources for the Future; and Dean Streiffert. As discussant, Dr. Yoho outlined basic differences between Swedish and USA forestry. His comments will be published in the March issue of AMERICAN FORESTS. Dr. Yoho, widely-recognized forest economist, is currently assisting AFA Chief Forester Kenneth B. Pomeroy in conducting a forest landownership study in North Carolina that is delving deeply into small woodland ownerships. As Forest Service Chief McArdle commented, if we could determine what motivates these small woodland owners we would be well on the way to solving the whole problem.

They are liable to grow worse as technical developments and rising wages will necessitate increased mechanization and strengthen the need for trained personnel and skilled labor.

The integration of forestry and farming has in Sweden as elsewhere its historical explanation in the early settlement of the land. It is evident that the ownership of forest land can add to the productivity and income of a farm in several ways. In Sweden this has been so obvious that forestry has been considered more or less necessary to support the farm operations, especially in the wooded regions of the country, where farming is less profitable and the average size of the farm is smaller. Thus, it was prohibited by law in the beginning of this century for companies to buy more forest land, and for several years it has been prohibited for anyone but a farmer to buy forest land.

On the other hand, it has been maintained that the integration of farming has led to negligence of the

sound management of the adjoining forest land.

To sum up the contents of the discussion on this question, the following advantages and disadvantages of the integration between farming and forestry may be recorded.

Advantages: Labor and draft animals on the farm can be better utilized to the advantage of both farm and forestry as the slow season in farming coincides with the busy season in the forest.

Small or nonsalable trees that need to be thinned or cleaned out can be cut and used on the farm.

The small holding will permit intensive management as the owner learns to know his forest in great detail, provided he is willing and able to make use of this advantage.

Disadvantages: The farm has greater and more urgent claims to the owner's resources of time, labor, and money than the forest, as the cultivated land cannot be neglected without immediate consequences to the income and living standard of the owner. Thus, the forest is apt to

receive a smaller part of the owner's total resources than it could claim if the owner tried to realize the greatest income from the combined farm in the long term.

The private owner, and especially the small private owner, has a shorter range view than the forest-owning industries and the state. This makes him reluctant to invest in forestry, even if it can be shown that it is financially profitable.

The farmer already has one main occupation and cannot be expected to devote himself wholeheartedly to another at the same time. This should make him less interested in managing a forest property, at least on his own.

The advantages and disadvantages thus enumerated, referring to Swedish conditions, will probably be of a universal nature only with the exception that the length of seasons of the year may be more suitable for combining agriculture and forestry operations in other areas.

So far as the management is concerned, it would seem from the above that investments in silvicultural measures would be less attractive to the farmers than to the other groups of forest owners dealt with here. One should, therefore, expect a poorer state of management in the farmers' forests in this important respect, unless assistance from agencies can be mobilized. However, such agencies are employed in most countries where the farm forests are of importance in some respect or another.

The commonly used means to secure sufficient investments in farmers' forests, as in other private forests, are financial aid and education provided by the government. The upkeep of investments in order to secure a sustained yield from the forests is primarily in the public interest, and the before-mentioned measures are thus administered by public agencies and constitute together what may be called the public forest policy.

As for raising of efficiency of management on small forest holdings, it has previously been pointed out that this is primarily a question of financial returns, and as such is left to the forest owners themselves. This has resulted in different forms of co-operatives.

However, there is no clear boundary drawn between the activities of these two groups inasmuch as the public agencies also help in raising the efficiency of management, and the forest owners' co-operative organizations encourage their members

to increase their investments in silvicultural measures. As a matter of fact, some measures are working both ways, for instance, in the education of forest owners.

Next, public forest policy in Sweden shall be discussed, with special reference to its bearing on the management of small forest holdings. Then the organization and activities of forest owners co-operatives shall be examined.

Swedish Forest Policy and Management of Small Forest Holdings

It should be stated that public forest policy in Sweden has exerted a decided influence in improving management on small forest holdings. The following are some of the outstanding developments.

After a long period of a regulated national economy in Sweden as in the rest of Europe, the liberalistic era of the nineteenth century brought freedom also to the Swedish forest industries. Under the influence of the rapid industrialization in Europe, the demand for Swedish forest products grew rapidly, with corresponding demands on the forests. This aroused the old apprehension of a timber shortage, and eventually resulted in the forest law of 1903 requiring reforestation after cutting. This law was passed only after much debating, since at that time, much more than it would have been now, this act was considered as an intrusion into private ownership. However, the law eventually was generally accepted by the forest owners, and has fulfilled its purpose.

It is important to add, however, that the law by itself would never have brought the desired result. A necessary complement to the law has been to educate the forest owners to the economic importance of their forest lands and of the best way to manage this valuable asset. This important task was left to the same authorities that supervised the forest law, i.e., the county forestry boards. These boards have been given a great deal of autonomy, and they have enjoyed the confidence and co-operation of the forest owners. This refers especially to the small forest owners, as the big forest owners have employed their own trained personnel. The small forest owners have had recourse to the personnel of the county forestry boards for advice and supervision of forest work. This has been a prerequisite of their co-operation. To a certain extent this service has been rendered without a fee or at low cost.

The forest law of 1903 was amended in 1923 with the stipulation that vigorous forests must not be cut except for appropriate thinnings. By a further amendment in 1948 the economic aspect was introduced, when it was prescribed that the reforestation duty of a forest owner should be calculated by the financial return on the cost of reforestation, to be decided upon by the central forestry board for private forests, established in 1936. (A vigorous forest is defined as one that is not to be clearcut as long as it renders a return on the forest capital—growing timber and soil—at a rate to be decided upon by the same authority.) The corresponding rates of interest have been fixed at 2.5 and 3.0 per cent respectively.

Although the Swedish forest law has been instrumental in molding public opinion toward improving forest management, especially on small forest holdings, it is now considered that further progress along this line cannot readily be achieved. As a matter of fact, the last amendment to the law has given rise to obvious difficulties in its application. Furthermore, it is significant that a committee recently appointed to investigate ways and means to improve silviculture and management on private forest lands, especially on small forest holdings, could not recommend any new amendments to the forest law. Nor did this committee find it advisable to increase the present restrictive grants for silvicultural purposes reserved for special cases. Instead, the committee strongly recommended a strengthening of the educational work of the county forestry boards and associated activities, such as providing the small forest owners with simple working plans for their forests. The aim should be to further develop the knowledge and interest of the small forest owners in the ways the forest responds to different treatment. Thus they will be able to determine the best ways and means to increase the return of their forest land, much in the same way they are used to calculating the best ways to increase the return from agricultural land. The progress in the future will depend mainly on the strengthening of the educational agencies as far as public forest policy is concerned.

Co-operative Movements

I shall now discuss the possibilities and limitations of the co-operative activities of the small forest owners. As previously shown, the disadvan-

EIGHTH NATIONAL WATERSHED CONGRESS

Ramada Inn, Tucson, Arizona, April 17-19, 1961

GENERAL THEME: COUNT-DOWN ON WATER

Monday, April 17

Morning:

8:00—Registration: Main Floor,
Ramada Inn

Session I:

PLANNING FOR WATER USE

- 10:00—Water Needs of the Nation,
1980-2000—Hon. Robert S. Kerr,
U. S. Senator from Oklahoma.
10:30—Discussion.
10:40—Soil and Water Conservation
Needs Inventory—Donald A. Wil-
liams, Administrator, U. S. Soil Con-
servation Service, Washington, D. C.
11:10—Discussion.
11:20—Legal Barriers in Water Use
Planning—Frank J. Trelease, Dean,
College of Law, University of Wyo-
ming, Laramie.
11:50—Discussion.

Luncheon Meeting

- 12:15—Address of Welcome—Arthur
N. Pack, President, Charles Lathrop
Pack Forestry Foundation, Tucson,
Arizona.
Remarks on development of "Water
Street U.S.A."—William H. Carr,
Founder and Director Emeritus,
Arizona-Sonora Desert Museum,
Tucson.

Session II:

Afternoon:

- 2:00—Buses leave Ramada Inn for
meeting on "Water Street U.S.A."
6:00—Chuck wagon dinner and en-
tertainment at "Old Tucson."

Tuesday, April 18

Session III:

MULTIPLE USE OF WATERSHEDS

Morning:

- 9:00—Opportunities in Multiple Use
of Watersheds—Harold G. Wilm,
Commissioner, New York State
Conservation Department, Albany.
9:30—Discussion.
9:50—Water for Agriculture, Industry
and Recreation—Hon. Lewis W.
Douglas, Former Ambassador to Great
Britain, of the Southern Arizona Bank
and Trust Company, Tucson.
10:20—Discussion.
10:40—Motivating Multiple Use of
Watersheds—Marvin Melton, Presi-
dent, Arkansas State Chamber of
Commerce, Little Rock.
11:10—Discussion.

Luncheon Meeting

- 11:45—Spectacular Life Zones in Evi-
dence on Mt. Lemmon—Norman P.
Weeden, Supervisor, Coronado Na-
tional Forest, Tucson.

Field Trip

Afternoon:

1:30—Buses leave Ramada Inn for tour
up Mt. Lemmon.

Annual Dinner

Evening:

7:30—Toastmaster: C. R. Gutermuth,
Chairman, Steering Committee and
Vice President, Wildlife Management
Institute, Washington, D. C.
Presentation of Awards:
Watershed of the Year
Watershed Man of the Year
Principal Speaker: "How Watershed
Programs Help Communities Grow."
L. L. Males, President, Security State
Bank, Cheyenne, Oklahoma.

Wednesday, April 19

Session IV:

WATER FOR A THIRSTY LAND

Morning:

- 9:00—Arizona Water Management
Programs—Andrew L. McComb,
Head, Department of Watershed Man-
agement, University of Arizona,
Tucson.
9:30—Discussion.
9:45—Water Yields from National
Forests—Richard E. McArdle, Chief,
U. S. Forest Service, Washington,
D. C.
10:15—Discussion.
10:30—Watershed Management on
Western Ranges—Karl S. Landstrom,
Director, Bureau of Land Manage-
ment, Washington, D. C.
11:00—Discussion.
11:15—Watershed Management to Serve
Reclamation Needs—LaSelle E. Coles,
President, National Reclamation As-
sociation, Prineville, Oregon.
11:45—Discussion.

Luncheon Meeting

Afternoon:

- 12:30-3:00—Future Water Needs for
Recreation—Francis W. Sargent, Ex-
ecutive Director, Outdoor Recreation
Resources Review Commission, Wash-
ington, D. C.

NOTES

A combined book of tickets is avail-
able covering the cost of registration,
the published proceedings of the Con-
gress, and all meal functions, bus tours,
and other scheduled events. Separate
tickets are available for those that can
attend only one or more functions, par-
ticularly local residents.

Arrangements have been made with
the Agricultural Research Service for
a post-Congress field trip to the 65-
square-mile Walnut Gulch Watershed at
Tombstone on Thursday, April 20.

tage of the small holdings, so far as
the size is concerned, is primarily its
lack of efficiency. To offset this dis-
advantage several kinds of co-oper-
ative activities have been practiced.
The co-operative movement among
the small forest owners should be
considered against the background of
the well developed co-operation be-
tween the farmers.

The Swedish farmer was an out-
spoken individualist after the break-
ing up of the old village communi-
ties about two hundred years ago.
This was done in order to organize
into workable units the farmland
that had been divided into smaller
and smaller lots by repeated parti-
tion resulting from inheritances.
Even the homes of the owners had
to be moved away from the village
center. Without the farmers' co-
operation as a forerunner, the For-
est Owners' Association could scarce-
ly have been able to break down the
individualistic tendencies still inher-
ent in the farmers at the beginning
of this century.

There are at present two kinds of
co-operatives among forest owners in
Sweden. The eldest and still by far
most common is the Forest Owners'
Association. These are local associ-
ations, generally working within the
boundaries of a county—there are 25
counties in Sweden. They have a
Central Board in Stockholm that
takes care of their common interests,
especially those of an economic and
political nature.

The other type of co-operative, the
so-called Forest Co-operative, is of
quite recent origin. The first co-
operative of this kind was founded
only in 1955. These have met with
considerable success and represent a
quite interesting and promising kind
of co-operation. I shall first deal
with the Forest Owners' Associations
as a background to the Forest Co-
operatives.

Forest Owners' Associations

The basic idea behind the Forest
Owners' Associations is to obtain the
highest price the market will allow
for the forest products delivered by
their members to the forest indus-
tries and other buyers, i.e., princi-
pally sawlogs and pulpwood. The
Forest Owners' Associations gather
all the scattered items of wood cut
by their members, group them into
lots of great commercial size for the
buyers to bid on. The members ne-
gotiate the price as partners of equal
standing. These negotiations are
now generally made for rather big

(Turn to page 52)



Mr. Cliff, who recently presented this report to the Mining Congress

Progress Report on the Mining Law

By EDWARD P. CLIFF

Assistant Chief, Forest Service

FOUR years ago I had the pleasure of presenting to the American Mining Congress a progress report on the administration of Public Law 84-167 on the national forests. This Multiple Use Mining Law was then only one year old and the Forest Service was just making a good start in administering it. I am pleased to be back with you again to discuss the progress being made under this statute and some of the problems encountered in administering it on the national forests.

Studies of mining records in various counties of the West indicate that over a million and a half unpatented mining claims have been filed on the national forests since the mining laws were enacted in 1872. There are, of course, many overlapping claims, but we estimate that at least 20 million acres of national forest land are included within the boundaries of unpatented mining claims. Prior to July 23, 1955, the principle of multiple use could not be applied on these claims. The enactment of Public Law 84-167 has made it possible for the Forest Service to practice multiple use management on a considerable part

of this land, and as time goes on we will be able to manage the renewable surface resources on most of it without interfering with prospecting and mining.

The determination of surface rights on mining claims in the national forests under the in-rem procedure by the statute is progressing very well. When the law was enacted in 1955 the Forest Service told Congress that we would plan to get the work done in ten years. Half of that time has passed and well over half of the job has been accomplished on the areas where surface rights determination is needed.

As of June 30, 1960, the Forest Service had completed the field search on 577 areas covering approximately 75 million acres, and made formal request for publication of notices for these areas. We estimate that these proceedings involve 782,000 mining claims. The 150-day period for filing verified statements by mining claimants has expired on 503 of the areas searched. These areas cover approximately 61,300,000 acres. Verified statements were filed by mining claimants for about 16,000 claims.

It has been our experience that most verified statements are withdrawn after the claimants learn they will not lose any mining rights which they have acquired by their mining locations. When a claimant does not withdraw his assertion of surface rights, the claims are examined by a qualified mineral examiner. If the examiner's report indicates that the asserted rights are valid, the Forest Service executes a stipulation to that effect and those claims are dropped from the proceedings. If the mineral examiner's report indicates that a claimant is not entitled to his asserted rights, he is given a hearing before a Bureau of Land Management Hearing Examiner to determine the validity of the asserted surface rights.

All required steps in proceedings under Public Law 84-167 have been completed on 204 areas containing approximately 24 million acres. There were 2,154 claims included on verified statements. The asserted rights on 294, or 14 per cent, were stipulated by the Forest Service as valid and those claims were dropped from the proceedings. Of the aforementioned 2,154 claims, only 26 have gone to a hearing. The asserted rights to these 26 claims were held invalid. The verified statements for the remaining 1,834 claims were withdrawn by the claimants. This

record indicates a high degree of mutual understanding and cooperation between mining claimants and Forest Service employees out on the ground.

A study made in 1958 shows that for the 28-year period since 1930 patent applications have been made for an average of 180 claims per year on the national forests. Of this number, an average of 124 claims have been clear-listed for patents by the Forest Service—that is, two out of every three applications for patents have been recommended for approval. During the 3-year period after the enactment of Public Law 84-167 the yearly average of applications for patents just about doubled. The ratio of patent applications to clear-listing remained about the same. The study also disclosed that over 33,000 claims were filed on national forest land each year for the first three years that Public Law 84-167 was in effect. If the filing of mining claims continues at this rate an additional 660,000 acres of national forest land will be covered by mining claims each year and subject to the provisions of Public Law 84-167. Without this law the renewable surface resources of these lands could not be managed under the multiple use principle.

Because of Public Law 84-167, the Forest Service now is able to plan for and manage the timber and other renewable resources on all of the new claims filed since July 23, 1955, and on all old claims on which the government has established its right to manage the surface resources. Without the law, a great deal of valuable timber would be tied up on unpatented claims and access to other lands would be impeded. The Forest Service could not sell the timber without the consent of the claimants and the claimants could not use it except for mining purposes. Now the Forest Service can manage it and make it available to support industry and local communities, and the miners can still use all they need for development of their claims.

The presence of highly valuable timber on some claims gives rise to one of the most difficult problems we have had in administering the new law. One striking example of this is a case on a national forest in Oregon where a mining claimant filed some 250 claims on land that averages over 60,000 board feet of timber per acre. This amounts to about 300 million board feet of timber. These claims completely blocked any logical sus-

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MOOSE

in the lurch

By FRANCIS DICKIE

SEEING a wild animal desperately struggling for life in a hopeless situation, the immediate action of every forester, game warden and lover of the outdoors, is to rush to its aid.

And, truly, never was a noble moose in so dreadful plight as shown in these photographs. It was saved only by the ingenuity and tremendous labor of two men, Reforestation Officer D. A. Skeates and Forest Ranger George Marek.

Though the winter season was well advanced in Forester Skeates' Geraldton District of Ontario's Lands and Forests, the ice on Sturgeon River still seemed safe to the young female moose as she came to its edge. On the other side of the river was some burned over land offering better feeding grounds. Unfortunately, Nature, contrary to some beliefs, does not endow her creatures with infallible instincts. And, at this time of the year this part of the river was deadly treacherous because the water in the ice was full of pulpwood sticks. Due to the current and the sticks only a very thin layer of ice had formed on this section of the river. Yet the ice appeared deceptively safe to the young moose.

The officers were on the opposite side of the river examining the burned over area for new planting operations.

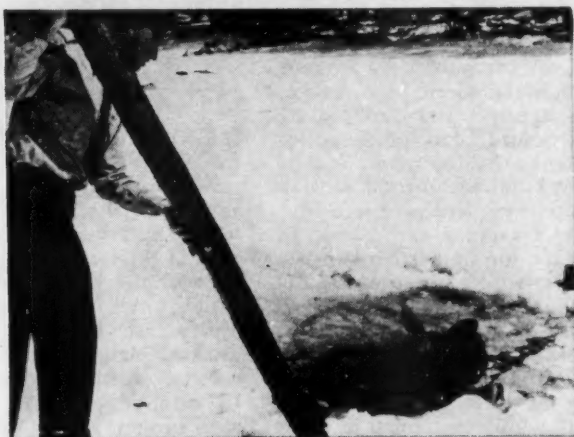
The moose stepped confidently onto the firmer ice of the shallow water close to shore. Then, after a few feet, the body went down. Thrashing wildly under the smooth ice in the deep water studded with pulpwood sticks, the wood blocked her ordinary powerful swimming ability, and she was quickly exhausted in the freezing current. With head resting on the ice, perishing with cold and panic she could not last long.

The men faced a terrific dilemma. How could they rescue the moose with the water under her crisscrossed

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Moose thrashes wildly in water after ice gave way beneath her



Forester Skeates uses pulp stick to chop a channel in the ice



Freed moose, almost frozen, looks back at the treacherous ice

Still chilled, the moose walks off slowly to her feeding ground



Not For a . . .

GOOSEBERRY PIE

By JOHN CLARK HUNT

HAVE you ever watched a fire race through the forest in a savage, towering rage and afterwards looked at the bare, dead earth and the skeletons of trees? Did you realize with a shock that hundreds of thousands, if not millions, of acres are left like this forest graveyard each year? If so, wouldn't you find it hard to believe that anything else could cause as much damage to the forest as fire?

The fact is that fire, with all its roar and spectacle, is a secondary destroyer. Research foresters have been reporting for a decade or more that insects kill a greater number of trees than does fire. These deadly killers constantly attack in their silent unspectacular and often unsuspected manner. They claim a tree or two here, a dozen there, or an acre somewhere else. Sometimes it is several acres, or in a major epidemic the forest in a whole watershed can be destroyed. Added together the toll of dead trees becomes greater than the loss by fire.

One of these silent killers is a fungus disease known as "blister rust." Its victims are members of the white pine family—the five needle pines. Blister rust is a unique type of disease. It cannot make a direct attack on the trees. It must employ an agent or host plant on which the spores of the fungus can develop, then attack the white pines. The host plants, called ribes, are species of gooseberry and currant bushes.

The need for an alternate or host has been both the strength and the weakness of the disease. It was a strength because gooseberries and currants seem to grow almost everywhere that white pines do. But the host plants also proved to be vulnerable. They could be dug up or killed by chemical spraying. Thus the disease which cannot spread from tree to tree has been controlled in many areas of valuable stands of white pine.

Since 1898, when blister rust invaded the North American continent on a shipment of young trees imported from Europe and planted in Nova Scotia, the disease has spread throughout the northeastern section of the United States, then leapfrogged westward into the white pine of the Great Lakes states. Fate seemed determined to infest all white pine in this country with blister rust. In 1910 a shipment of diseased planting stock from France entered British Columbia. Since 1921 the disease has been killing trees in most of our western states.

Millions of man days and dollars have been spent digging gooseberry and currant bushes from areas where white pine is the most valuable native timber species. Ribes eradication was one of the big projects of the Civilian Conservation Corps. Since the closing of the CCC in 1942 the work has continued on a smaller scale done mostly by contract with private individuals.

Has it succeeded? The answer is both yes and no. While the eradication of the host plants has been successful in the high value areas in the West, the disease is too wide spread and too firmly entrenched to be eliminated everywhere. Where control work has not been done the young white pines are dying.

There also is the problem of the delayed attack. An area can be worked as clean as a whistle with every gooseberry and currant bush removed, but if there is any disturbance of the soil, such as logging or a fire, the dormant gooseberry and currant seeds that are in the soil germinate and require further eradication work.

The hand digging of ribes has sometimes cost as high as \$25.00 to \$30.00 an acre on the several million acres of western white pine in Wash-

(Turn to page 60)



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1. In a heavy concentration of ribes, too numerous to dig, the bushes are killed by spraying them with chemicals

2. Heavy cotton chaps are worn by the crewmen while digging ribes in brush to protect them from long sharp thorns

3. The lower portion of trunk of white pine tree is being sprayed with an antibiotic to kill blister rust disease

4. This small blister rust camp in the southwestern part of Oregon supervises contract eradication of ribes in area

5. This young white pine shows disastrous effects of blister rust infection

6. A five-man crew and leader laboriously work at digging up gooseberries

7. Only relics of a white pine timber stand can be seen at timber line on Mt. Hood, Oregon. Blister rust attacked and killed these scenic high-elevation trees on this popular recreation area

8. *Ribes klamathense*, one of several species of the genus *Ribes* that spreads the blister rust disease, grows wild in the sugar pine regions of Oregon



8



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Parks, Seashores, and Canals

FORMER President Eisenhower on January 18 signed into law a designation of the 165-mile long Chesapeake and Ohio Canal as the nation's newest national monument. Washington area conservationists were jubilant as "Ike," by presidential proclamation, designated the 4800-acre strip from Seneca to Cumberland, Maryland, a recreational heritage. The action was in response to a plea from the National Park Service and Senator J. Glenn Beall (R. Md.), both of whom have campaigned hard to achieve monument status for the historic old waterway. Previously the Congress had refused to act on the monument proposal since water interests had contended part of the waterway might be affected if a high dam proved necessary on the Potomac to provide for Washington's water needs. In the view of the Park Service, the President's action may help pave the way to convert the C. & O. into a full-fledged national park that would be protected forever from any other proposed uses.

In another pending recreational effort, the National Parks Association last month was stepping up its effort to make the proposed Cape Cod National Seashore in Massachusetts a reality and called on The American Forestry Association for help. In response, Chief Forester Kenneth B. Pomeroy, of AFA, urged the House Subcommittee on Public Lands to give serious consideration to H.R. 66 introduced in the House last month by Rep. Edward P. Boland, of Massachusetts. In a letter to Rep. Gracie Pfof, Chairman of the House Committee, AFA endorsed the principles expressed in H.R. 66 and said the association's Executive Committee on March 25, 1959, recommended "that the still unspoiled Great Beach portion of Cape Cod be protected and preserved for the enjoyment by the public of a Cape Cod National Seashore."

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The Great Beach region of Cape Cod should be preserved as a national seashore



The 4800-acre strip along the historic C.&O. Canal is now a national monument

Dinosaur National Monument, back in the news again, has been given more protection than ever before

Photo by Philip Hyde



John Preston, retired forester, recalls early days of his Forest Service career in . . .

THE BACK TRAIL

By JOHN F. PRESTON

I was due to arrive in Missoula, Montana at 6 P.M. on August 6. I sat in the Vista Dome of the North Coast Limited and watched the train climb to the continental divide through Deerlodge National Forest. It was familiar ground in a way, and yet it was not—too many years had passed since I last saw it. A new forest of fir and spruce had grown where old fires had burned. No sign now of that old forest—this was a new one, a beautiful high altitude sparse growth of sharply pointed evergreens, frequently interspersed with grass and shrubs—mountain meadows.

Forty years had passed since I lived in Missoula, and now I was return-

ing for a brief visit. I knew that Missoula would be something akin to the forest that I could see on either side of the railroad; not many of the old stand (of folks) I once knew would be left—new faces, and a greatly changed and enlarged town. I was prepared to feel strangely alone and unknown, but I hoped to find a few of my old friends still around. Perhaps, I thought, I would feel something like the man Lionel Barrymore portrayed in the old movie, "The Return of Peter Grimm."

The train proceeded cautiously down the western slope, through Butte; so far as I could tell, not a great deal of change there. I had

hoped that I might find an old acquaintance on the train—a fellow traveller who looked familiar, but so far I had found none.

Now it was lunch time in the dining car, a little late maybe. I better see if I could get in. I had waited a long time in line for breakfast. This time I was admitted at once, at a table where a lone man sat opposite. He had a wind blown outdoor face and he was about my age class. I looked at him hopefully but I could not stir up any memories. "I really must not expect to meet anyone that I know, on this train," I thought. "Be lucky if I find a few after I get to Missoula." But somehow I couldn't dismiss the idea that I ought to know this man. I am not timid about talking to strangers (I used to be but not now). We talked about Butte and its wonderful history and its legends. That was easy. Finally, I said, "How far are you going?" He replied, "To Missoula, that's where I live now." I said to myself, "That sounds promising; I bet I do know this fellow." Then aloud, "That's where I am going too; I lived there once many years ago; worked for the Forest Service."

That did it. Up spoke my new found friend. "In that case, we either do or we ought to know each other, because I have spent my life working for the Forest Service, now retired." We knew each other by reputation only; our trails had never crossed. He was Clyde Fickes. His name brought to my mind a whole series of events with which he was identified; a ranger on the Flathead; he took the examination the year before I went to Kalispell as forest supervisor, but he had moved on to eastern Montana by the time I arrived. I remembered him as a man much in demand to take charge of fire crews, and I remembered him in connection with various activities in Idaho, on the Nez Perce and other forests. In short, I knew him to be a highly respected and accomplished forest officer. I was indeed very glad to meet him.

We had a delightful visit; we each knew most of the "old timers." Before we left the train in Missoula, he said, "John, I am sure, you would like to have a visit with as many of your old friends as are still available." I, of course, agreed. We made a list of names; it was not a very long list. Father Time had been rather ruthless. "I'll call as many as I can reach and we'll have lunch with you at the Florence Hotel on Tuesday."

Well, I was relieved and mightily

pleased. I was scheduled to leave Missoula on Wednesday and this was Saturday night. I had arranged to leave Missoula by car with my son John, his wife and two boys (17 and 14) and drive through Glacier and Mt. Rainier National Parks, then to Portland, where I would leave them.

On Monday, I visited the Forest Service office, but of course I did not expect to find anyone I knew. My friends would long since have been retired. I did find one though. "Red" Stewart was still there, only he was no longer red. The Forest Service just could not give up his services. We had to be introduced; with no red flag flying, how was I to know Mr. Stewart. That was my excuse anyway. I do not remember his, but we were both pleased nevertheless.

Regional Forester Tebbe arranged a guided tour for me through the Forest Service smoke jumper headquarters and the new Forest Fire Research Laboratory. Both were quite impressive to one who was once quite familiar with the fire fighting organization and methods of the 1920's. Rain had fallen yesterday; rain in August in western Montana! I never really expected to witness that phenomenon. Perhaps with the intensified research program the new laboratory will make possible, it will rain on Montana forests every day in summer, and rain especially hard after each lightning storm. I suspected that was what the builders had in mind because the new laboratory seemed to be a much more elaborate building than the smoke jumpers quarters. Certainly, if they can arrange for the rains at the right times and in "plenteousness," the smoke chasers' quarters would not be needed. As an old fire fighter, I approve of such an objective, and may GOD BLESS THEM.

I was treated royally on my tour, and I enjoyed every minute of it. Even this day, the sky was overcast, the temperature was not high nor was the humidity low. There was no emergency. Secretly, I had hoped to witness at least one plane take off for a fire with a full complement of "jumpers" and their equipment, including the chemicals for cooling off the fire to make the work of mat-tocks, saws, and shovels easier. I also had a secret hope (rather faint I admit) that I might be allowed to ride along—not to jump but to watch the operation from the plane. No such luck; but I did enjoy seeing the jumper equipment and listening to the stories of how the jumpers are

trained, and how confident the men seemed to be that they could handle the fires by the new methods with a better chance of success than we had years ago. Still a long way to go, however, as evidenced by the current expenditures for the fire research laboratory.

At our luncheon on Tuesday, we did a great deal of visiting, reminiscing, but not much real serious talk. Many changes have taken place, not only in handling fires but in the business of forestry. Most of them are, of course, due to increased volume of business—timber sales, grazing, recreation. "Couldn't handle it the way we used to," they told me. "Had to hand the responsibility further down the line to the supervisors and the rangers. Now we have larger forests and the rangers have staffs, clerks, and well equipped offices."

There was evidence of the changes in the wood business everywhere I went. For example, in the old days lodgepole pine was cut and marketed as house logs, fences, railroad ties, and fuel, but chiefly the market was for mine timbers and smelter poles. Now it finds additional markets as lumber, pulpwood, and various combinations — made-up-products — where narrow widths are used.

I was once supervisor on two national forests—the Beartooth and the Blackfeet. They no longer exist, having been combined with others to make larger units (forests), and given new names. I could look out of the Vista Dome in eastern Montana and see the Beartooth Mountains, but they are now a part of the Custer National Forest. Likewise, when we drove North to Glacier National Park, I could see the Blackfeet Mountains, but now part of them are in the Flathead Forest and part in the Kootenai. When I realized what was happening, I had a somewhat hurt feeling. I loved those mountains; I had my roots there, and the Forest Service had written them off the map—obliterated them! And, I had not even been consulted! Well, I guess that is what "Old Timers" have to expect.

In some ways it was a grizzly bunch that Clyde Fickes rounded up and gathered at our luncheon table that day—a full count would show about ten or twelve. We did not call the roll, so I will not try to name them all (but I think I could). I might forget one or two and I would be very sorry to do that. Ross Williams, now dean of the Forestry School at the University, and an old friend of mine, but not from Mis-

soula days, was there, as was my nephew, Dr. Steve Preston, a successful physician in Missoula. These two helped lighten the pressure of gray hairs because they were not in the "Old Timer" class. Rutledge Parker, 83, was, I think, the oldest man present and undoubtedly the spryest. Rutledge was born and grew up in South Carolina, but he has lived in Montana for the past 50 years at least. Yet, the South Carolina brand was still in his voice; no one could be in any doubt about his birth place.

My son John, who was born in Missoula, and with whom I was to travel next day, came to town just before noon that day but he was not expected until late afternoon. He was in the hotel for a few minutes while our luncheon was in progress but, of course, he did not know about our big doings, so we failed to have him as my guest. I would have been so pleased and proud to have been able to have introduced him to my old friends. John was only three years old when last he saw Missoula, so, of course, he remembered nothing about the town. I had the pleasure of showing him the house where he was born, 237 South Sixth Street East—where in winter I always set the alarm clock to get me up in time to shovel the snow or sweep the front sidewalk before departing for the office. I could not be sure of what John thought of his birth place, but it was a grand place to his mother and to me.

Three of the old timers could not get to our luncheon because of disability or absence from town. I was sorry. One graduated from the university in my class. Another was Joe Halm, who used to be a ranger on the Coeur d'Alene during the 1910 fires. I had some stories I wanted to tell about him—some, I thought he might not remember, but maybe it was just as well. I told the boys my story about the bull moose on Isle Royale. It is a tricky story. I leave out a very small detail to see if anyone will pick it up, because without that little item, no one, even those unfamiliar with the characters of bull moose, would believe my story. So, if my audience does not detect the detail I have omitted, I am forced to tell them what it is, in order to maintain my reputation as an honest man. I thought these moose hunters would detect my trick very quickly, but they didn't. I had to tell them.

On our way next day in the car,
(Turn to page 65)

12 SUGGESTIONS FOR IMPROVING FEDERAL RESOURCES INVESTMENT

YOUR INST

Steps to Broaden the Decision-Making Structure

1. Closer Relation of Planning to Long-Range Needs and Trends
2. Submission of Alternative Plans by Action Agencies
3. Effective Over-all Review by Executive Branch
4. More Active and Critical Review by Congress
5. Federal Encouragement of State Participation in Planning and Development

Steps to Improve Analysis of Investment Possibilities

6. Full Application of Benefit-Cost Analysis, Including the Incremental Approach, to Water Development Proposals
7. Development of Benefit-Cost Analysis for Proposed Investments on Federal Lands
8. Adoption of a Capital Budget for Resource Investment

Steps to Make More Use of Market-Type Forces as Investment Guides

9. Competitive or Cost-Based Pricing for Services Now Provided Free or Below Cost
10. Limitation of Federal Subsidies to Some Maximum Percentage of Total Investment
11. Imposition of Federal Taxes to Foster Nonfederal Investment in Waste Treatment of Water
12. Adoption of Corporate-Type Operation for Some Resource Activities

ABOUT THE AUTHORS

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By MARION CLAWSON
and IRVING K. FOX

INVESTMENTS IN LAND AND WATER

PART II—TWELVE STEPS TOWARD SOUNDER CHOICES

In their article last month the authors looked at the decision-making procedures for federal investment in land and water resource development and concluded that the present machinery is inadequate to the increasing task that the future will lay upon it. This month they suggest a dozen specific improvements that might be made within the existing framework of our federal democracy.

Federal resource investment programs for land and water are less satisfactory than they reasonably could be. In the past this may not have been too serious; there was room for mistakes and lost opportunities. In the future the margin for error will become more and more narrow.

The national economy will grow, and this will require more resources of all kinds. More federal money will be invested, for the national government has traditional responsibilities that will grow and broaden.

At the same time, there will be severe competition for federal funds as resource investment competes with many other urgent national programs. The frequent discrepancy between local or regional interest and the national interest will create further complication.

The present process for making federal resource investment decisions is not conducive to wise decisions. Too many actions are taken without consideration of all the available alternatives, or on imperfect or misleading information, or on the basis of tradition. These faults are serious. The sums involved annually in federal land and water investment

are now large, and will be larger; what is vastly more important, the resources so developed are essential to national welfare and well-being. Of course, to put the problem in perspective, the United States is hardly faced with utter ruin if it clings to its present methods. But the price of inertia will be steep: many good opportunities will be lost, costs will be too high, and in other ways the national effort to get the most out of its land and water resources will fall far short of what we could accomplish.

In this article we offer a dozen possibilities for improving federal investment programs in land and water resources. All of them relate to the decision-making process. Although we believe that our suggestions are practicable, we are in no sense offering them as all or part of a recommended program. They are bare sketches of ideas that we hope will stimulate public interest in the problem and perhaps offer leads to its solution. If any of them should be carried further, much more analysis and refinement would be required. Each of the dozen suggestions has variations that are not even mentioned here.

Almost all of these suggestions are independent, in the sense that any one could be adopted without requiring adoption of any others. Several, however, are complementary; adoption of one would greatly reinforce and enhance the results of the others. As the box on page 28 shows, the possibilities fall into three groups: (1) broadening the framework for decisions, (2) improving the basic analyses, and (3) making more use of market-type inducements and deterrents.

Future development of land and water resources will come at higher cost





Steps to Broaden the Decision-Making Structure

A basic deficiency in federal resource investment decision making is the process by which it is performed. A satisfactory process must insure that accurate and adequate data are considered, that all possible alternatives are explored, that all interested groups are heard, and that the merits of investment opportunities in other fields are fully considered. Resource investment decisions must be made periodically for an indefinite period into the future; they never can be made once and for all. With sound processes, wise decisions are more probable. So we raise first a number of suggestions for improvement in the process itself, especially the framework within which decisions are made.

1. *Closer Relation of Planning to Long-Range Needs and Trends*

At present, federal resource investment policies are rarely examined in the light of existing or prospective national requirements. No unit of the federal government is responsible for providing the general economic framework for resource investment decisions. One step further down, there is provision for estimating future national water demands in order to guide federal investment in specific water resource projects. Nor is there such provision for land demands.

Some excellent work has been done in specific situations. The Forest Service, to name an outstanding example, makes its periodic forest resource appraisals. But these deal with but a single forest use—commercial timber production. The Senate Select Committee on National Water Resources is making the first comprehensive effort to estimate future water demands. This is, however, a one-shot endeavor. In an-

other pioneering effort, the Outdoor Recreation Resources Review Commission is appraising the overall demand for outdoor recreation. This, too, is a nonrecurring study. None of the individual efforts of this kind offers comparisons of investment needs and opportunities for the different resources—water, recreation, forests, etc.—or provides continuity even in its own field.

The whole resource investment decision-making process would be greatly strengthened by providing some means for periodic, comprehensive resource appraisals that would examine water needs for all purposes, recreation demands and opportunities from all sources, timber demand and supply possibilities, and public land products generally. This would give a basis for judgment as to the relative urgency of investment in different directions and for different purposes.

By themselves, of course, such appraisals would not insure that all decisions were wise and in the national interest. But without them it is difficult, if not impossible, to do a good job, no matter how hard a single agency or individual members of the Congress may try.

We do not advocate which particular method of achieving this general objective is best. In the Executive Branch, no unit capable of making such overall appraisals exists today. S. 2549 in the 86th Congress, First Session, proposed to establish a Council of Resources and Conservation, in the office of the President, and as advisers to him. As such, it would be roughly comparable to the present Council of Economic Advisers. Conceivably such a unit could provide the leadership necessary to see that such a job is done. In view of the diverse programs in resources

and the way they are scattered through several agencies, it seems essential that leadership be supplied by the President's office, whether it be the Bureau of the Budget, the Council of Economic Advisers or some new office established for this specific purpose. It would also be helpful if there were an effective arrangement in Congress for the comprehensive review of resource investment programs.

2. *Consideration of All Potentialities and Submission of Alternative Plans by Action Agencies*

Another grave deficiency in existing resource investment planning is the failure of planning agencies to examine all potentialities for meeting a given problem or demand situation. Each agency tends to meet every problem in its traditional way. With few exceptions the federal land management agencies have seemed to plan outdoor recreation facilities as if nonfederal lands were unavailable for recreation purposes. Water resource development planning has given little or no attention to measures for making more economic use of existing sources of supply. Planning for "flood control" is a good example of this narrowness of framework. The term itself is a misnomer. While small floods can in fact be controlled, truly large ones cannot; sometimes because it is physically impossible and sometimes because the cost would be prohibitive in terms of probable results.

In spite of major flood programs since 1936, involving a total investment to date of about \$4.6 billion, annual losses from floods have risen steadily, and the hazards of loss from floods today are greater than when the program began. This does not mean that the program has been wholly ineffective, but rather that oc-

cupancy of the flood plain has risen faster than flood protection has increased. Clearly the approach to this problem has been too restricted; it has aimed at floods and not flood hazards.

The federal government has, perhaps unwittingly, contributed to this situation, rather than ameliorated it. The public has assumed that the federal flood programs have provided a degree of protection which in fact they do not, and cannot, provide. The federal agencies have not, perhaps cannot, set the public straight on this matter. Federal credit under-writing agencies have acted as though the flood hazards were in fact cured. Local land-owners have been able to reap a financial gain from this misunderstanding, by selling land at values which would be justified, if at all, only by absence of flood risk. Land purchasers have assumed that flood protection has been provided; or, that if floods should occur, public agencies would bail them out for losses incurred.

If the broader approach were taken, a first step would be to provide readily accurate information on the flood hazard in threatened areas. This could be supplemented by a greatly strengthened flood warning system. In addition, some controls should be exercised over the flood channels and plain, to prevent obstruction to normal floods. An important step would be an adequate system of flood damage insurance, one whose rates would reflect accurately flood hazards, not only those inherent in the location but those growing out of type of building construction or kind of building use. Legislation already on the statute books, including a reasonably satisfactory law authorizing a program of flood damage insurance permits such a broad approach to be implemented. All that is needed is the initiative of the executive agencies and the cooperation of state and local governments in regulating flood plain use.

Not only is there an all too frequent failure to consider all potentialities but water development and land management plans are usually presented as a single proposal, on a "take-it-or-leave-it" basis. Outside of the planning agency—and, one often suspects, inside it as well—there can be no real idea as to what the practical alternatives are.

Development of a single plan is often defended on the grounds that preparation of alternative plans

would cost money. It would indeed cost something to prepare two or more alternate plans for a major resource development. But the absence of alternatives also costs a great deal—unknown but possibly large sums in terms of unnecessary cash costs, and even greater price in terms of lost opportunities. In the past, when one resource development plan often did not foreclose all later developments on a stream or in an area, the lack of alternatives was bad enough. But in the future, as streams and areas get more fully developed, this lack will be much more serious.

Up to now, departmental review officers, the Bureau of the Budget, and the Congress have neither insisted upon alternative plans nor provided the money for them.

We suggest that the general public, the various parts of the Executive Branch, and the Congress each demand that all resource development projects present alternative plans. If the proposal is to build a major dam at a particular place to supply a given quantity of water, everyone concerned should demand an estimate of the costs of other ways of assuring the supply needed. If the proposal is to develop a recreation area at a certain site to meet a given demand, alternative possibilities for meeting the demand should be examined and presented. And so on, for every major resource development proposal for which there are practicable alternatives. Wise choices depend on rational alternatives.

3. *Effective Over-all Review by Executive Branch*

Resource investment proposals from the various federal agencies

are not subject to effective review at any point within the Executive Branch. Departmental and Budget Bureau review is necessarily brief, and is severely handicapped by lack of alternatives, as pointed out above. Serious checking of estimates, of costs, and of benefits is nearly always impossible.

More serious, however, is the lack of analysis of how an agency's proposals fit into a national resource developmental program. A water development plan may be good, in the sense that its benefits are truly greater than its costs; but is this the best place for such investment as available funds makes possible? Is this type of project more urgently needed here than elsewhere? Is the proposed investment adequate to meet future needs? Is the project sound, but not timely now? These and related questions should be asked by reviewing agencies.

Some of the executive review of this kind might be done within departments, but mostly it seems a function at the Presidential level. The Bureau of the Budget might be strengthened for this task, or a new unit established. The first Hoover Commission made a great deal of the idea of an impartial board of review. The problem might be met in more than one way. Our only concern is that the need be fully recognized.

4. *More Active and Critical Review by Congress*

Congress plays an indispensable role in making federal resources investments, because it appropriates the funds needed. But it does not take an effective part in deciding on the merits of federal resource invest-

Most accessible national forest timber stands have been developed. Future road construction will often cost more per volume of timber made available than in past



ment projects. By default, the decision-making process is largely in the hands of federal agencies and pressure groups. On the whole, members of Congress have too many other pressing duties to give much attention to resource matters. As pointed out previously it has no basis for knowing what the alternatives are. Over the years Congress has gotten into a position where each Congressman is part of the pressure group process. Each Congressman finds himself committed to much resource development legislation and unable to consider its implications from a national point of view because the package includes items that will benefit his district.

If Congress wishes to regain the critical decision-making power, several steps are open. Insistence upon alternative plans is perhaps first in importance. If more than one plan were presented, Congress could in fact make a choice. It could discontinue the present practice of making omnibus flood control, and rivers and harbors, authorizations each two years. These are the "something for everyone" bills which are difficult to resist. Instead, programs for each river basin could be taken up separately, as needed, and revised separately when necessary. This would greatly facilitate independent judgment and action. Another change would be for Congress to provide investment funds for river basin programs as a whole, and leave to the Executive Branch the allocation of funds to specific projects. This would surely facilitate the most economical rate of construction of projects once they were initiated—a situation which does not prevail today. It might also make possible somewhat more economical choices among projects. With the total sum for a river basin fixed, even the least modest local pressure groups would seek the best possible use of the available funds.

Somewhat similar considerations apply to federal land programs, although present pressures are not so great here or the possibilities for improvement so large.

5. *Federal Encouragement of State Participation in Planning and Development*

The states have an important place in the nation's whole governmental picture. Governmental powers reside in the states except as they have been specifically assigned to the federal government by the Constitution or delegated by the states to local governments. In the last several decades the role of the states in resource development, as well as in many other fields, has declined greatly. The states labor under serious handicaps for strong and effective action. Most of them lack revenues for large-scale resource investment; they are often inadequately staffed for such programs; the typical rurally-dominated state legislature shrinks from active programs in this and other fields.

Many people want the states to play a larger role in the total governmental structure than they now do. But much of the talk along these lines has been nostalgic nonsense. Few specific actions have been taken to enlarge, or restore, the role of the states.

There are good reasons why states should take a more active part in resource development, especially of water resources, if practical means for doing so can be found. Water developments benefit local people primarily; water is used locally, not on a national market. States have most of the legal powers relating to water use, and to taxation involving land and water. If one believes in the democratic process as applied to governmental actions, then the way this may be achieved at the local level is likely to be through state action.

While the lack of correspondence of state boundaries and watershed boundaries imposes a problem, it need not be a complete barrier to action. Some water development activities can be done by single states, others will require co-operation between two or more states. Interstate compacts offer one means of dealing with problems that cut across several states. In other instances, each state might take a part of a larger project.

Perhaps the most important possibility for strengthening the role of the states in water development would be a system of federal grants-in-aid, on a matching basis, for water resources planning. Funds would be made available with which the states could employ competent personnel. The water resources planning could be for state development, for private development, or as a basis for review of proposed federal development. Apportionment of grants-in-aid for planning probably should be based upon such factors as population and geographic area.

A second specific measure would be a system of federal grants-in-aid and loans for actual state water development. Grants might be equivalent in amount to the subsidy that would arise if the same project were developed by the federal government. If there is a national interest in a particular water development project sufficient to warrant a federal subsidy, is there not also a sufficient national interest to warrant the same subsidy to the state for its construction of the same project? Federal loans to states might be on a similar basis. For example, interest-free capital might be furnished for costs of irrigation, provided other features of reclamation law were also carried out by the state. If grants were made to states, they should obviously also be available to groups of states wishing to undertake larger projects. Subsidies or grants-in-aid to states should, of course, be under clearly specified conditions and subject to review by some competent federal agency. [A related opportunity for greater state responsibility will be explored later, under suggestion number 10.]

Despite a total investment of about \$4.6 billion in flood projects since 1936, annual flood losses have risen



Steps to Improve Analysis of Investment Possibilities

Thus far we have considered some possibilities of improving the overall structure of federal resource decision making. Now we turn to measures designed to strengthen operations *within* whatever structure exists or may be created. Because of the wide range of these opportunities, let us divide them into two groups. The first of these which we shall explore concerns improvements in economic analysis.

Benefit-cost analyses can be useful guides to resource investment decisions. In practice, benefits have tended to be overestimated, costs underestimated. This is a natural result of making a "favorable" cost-benefit ratio a requirement for official endorsement of a project that strong pressure groups, outside or inside the bureaucracy, wanted to construct. It must be guarded against. It is also true that not all decisions about resource investment do or should rest solely on strict monetary advantage. Other factors may often enter the social and political decision. But, at the very least, we should know what price we pay for actions other than the financially most advantageous.

6. Full Application of Benefit-Cost Analysis, Including the Incremental Approach, to Water Development Proposals

In spite of announced policies to the contrary, available evidence indicates that the Corps of Engineers and the Bureau of Reclamation seldom apply the benefit-cost approach to individual increments of projects. At the best, they make their benefit-cost analyses in terms of whole projects, or whole river basins. The results are presented in terms of overall totals, averages, or ratios. Concealed among such overall figures are often major differences for separable parts of the whole project or group of projects. Some parts have highly favorable benefit-cost ratios, others have costs well in excess of benefits.

A still more serious shortcoming of current practice is to consider all

parts of the whole project as if they could be simultaneous. It is, of course, impossible to build all parts of a project at the same time. The value of a particular dam or other project feature depends largely upon when it is built. Because the first dam provides a lot more river regulation than does a second dam of the same storage capacity, the benefits of a dam depend largely upon whether it is first, second, or third in point of time on a particular stream. This matter of timing is one to which any well run private business pays great attention.

The water development agencies should make benefit-cost analyses for each separable part of large projects and on the basis of the incremental approach, with due regard for alternatives in sequence and timing. This will require more work and more expense in planning. However, with new electronic computers and other devices, the computational problems are much simpler than they once were. The consequences of adopting this approach may be very great, especially in large river basins.

7. Development of Benefit-Cost Analysis for Proposed Investments on Federal Lands

Public lands serve a variety of purposes. They produce timber; they yield water; they produce forage for livestock; and they offer opportunities for outdoor recreation. These uses vary in their degree of compatibility. Recreation is not always compatible with optimum timber yield. Similarly management of a watershed for optimum water yield may not be compatible with management for optimum benefits for recreation or for optimum forest production. With the explosive growth of outdoor recreation and the growing shortage of water in the West, public land managers are confronted with the difficult task of arriving at an appropriate balance among the uses of public lands for these different purposes. An equally difficult problem is to estimate the optimum or most economic level of

federal investment in land resources. When should an access road be built into a particular area, and to what standards?

As yet, no method of analysis has been devised for systematically determining the proper balance and level of investment warranted. One reason is that neither the public, the Bureau of the Budget, nor the Congress has demanded such analyses in the past, or offered to help provide the necessary funds for making them. The problem is quite similar to water development, both involving multiple use, intangibles, and a combination of on site and off site benefits. It seems timely to give serious consideration to the development of a benefit-cost system as a guide to the kind and level of investment warranted in public lands. Pending the development of such a system, readily available procedures for economic analyses could be utilized to great advantage in determining the desirability of possible investments.

8. Adoption of a Capital Budget for Resource Investment

Under present federal budgetary and appropriation procedures, expenditures for capital investment are lumped with annual operating costs in a single total. This is contrary to accepted business practice. Large private firms separate their investment outlays from their production, marketing, and other annual expenses. At the same time, they charge against annual operations a reasonable depreciation charge on past investments. Under static conditions, the depreciation charge each year would equal the new investment item. But if a business were growing, investment would normally run far ahead of depreciation on past investment. No one would consider this "deficit financing," even if the firm had to finance the difference out of borrowed funds.

The difference between investment and operation outlays might well be recognized in federal budgetary procedure by separating these two types of expenditure in both esti-



mates and appropriations. This need not be, as some fear, merely a device to avoid counting the expenditures for investment, for such items would have to be included somewhere in the federal budget. Moreover, a reasonable accounting procedure requires charging depreciation of former investments against current operations. Because the scale of federal resource investments is rising, new investments would run ahead of depreciation charges for many years.

There might be difficulties, for in federal resource management it is often hard to separate investment outlays from management expenses. For example, planting trees on a potential forest site would normally be considered an investment. But the necessity for artificial reforestation might be avoided, at least in some instances, by forest management practices which led to natural reseeding. The cost of such management practices would often not be considered an investment outlay. However, in

spite of such problems, it should prove possible to establish and maintain a capital account for the major federal resource programs.

The capital budget is primarily an accounting device. As such, it works no miracles, but it does greatly facilitate sound decisions and clearer thinking about investments. Its proposal here is closely related to several other of our suggestions for it is peculiarly complementary to various other possible changes.

Steps to Make More Use of Market Type Forces as Investment Guides

Private business must obtain a profit from its operations. The motivation for public activities is different. There are broad social reasons why the federal government engages in activities of a semi-business character, such as flood protection. National parks and national forests are in public ownership because most people believe that in this way significant public values are secured. Such governmental activities are not for the purpose of making a profit.

Yet publicly owned or managed resource activities require investment. They also involve annual cash expenditures for management and operation, and in many instances produce cash revenues as well as other benefits. Thus, in spite of the fundamental differences in motivation of public and private resource activities, there are a number of similarities.

Some methods of private business can be applied to public resource management. Prices and charges are made for goods and services produced, subsidies are often extended,

and taxes are levied. All of these are powerful tools for conduct of public business. They have not been used purposefully or effectively in the past. The thesis underlying the suggestions which follow is that the public purpose of resource management can be retained while at the same time these tools so often associated with private business are utilized more fully.

The final suggestion in this group goes beyond the leverage of prices, repayments, and taxes, and considers possible modifications in the decision making and operating structure itself. Other business and market tools and mechanisms might be applied to federal resource investments—as indeed they might be applied to other aspects of public business. Over the centuries, Western Man has developed some marvelously effective business devices for private economic activities. Such devices perhaps have greater applicability to public business than is generally realized.

9. *Competitive or Cost-Based Pricing for Services Now Provided Free or Below Cost*

Most products and services from public lands or from federal water development projects are available to the public at less than a commercial price. A good case can be made for selling merchantable products at prices more nearly approaching a full commercial level. For one thing, only a comparably small portion of all citizens has a chance to take advantage of the lower prices. Taxes are spent to provide advantages which necessarily accrue to only some people.

As an example, let us look more closely at recreation. Recreation use of public lands and federally developed waters has traditionally been offered free or at very low cost. There are several reasons for this. In the past, recreation was only an incidental use of many areas, and some agencies did not consider recreation one of their major interests. This was not true, of course, of the national parks, but there the desire to get the widest possible public use was apparently the basis for low fees. Another kind of reason applies in instances where access is possible at

many points and total usage is not high; there it would be expensive to collect entrance fees, compared to the revenues that might be obtained.

Perhaps even more basic is a widespread conviction that recreation should be freely available to all citizens, regardless of their income. While this is a creditable sentiment, it overlooks the fact that most federally owned areas involve substantial travel time and cost for their use. Those who can afford these other costs are not in good position to argue they cannot afford somewhat higher entrance fees.

For such reasons, questions may well be raised as to the equitable or economic justification of low charges for federally provided or assisted recreation. The imposition of fees would offer many advantages. Fees would encourage a better balanced allocation of use between public and private facilities. By indicating the value attached to public facilities they would serve as a guide to public investment. If the returns could be plowed back into more and better facilities and more and better current management, the public would be better served. Almost all federal areas are seriously deficient in facilities of various kinds. It seems reasonable to expect that much of the anticipated popular opposition to entrance fees would disappear if the revenues were used for badly needed improvements.

10. *Limitation of Federal Subsidies to some Maximum Percentage of Federal Investment*

Subsidies are widely prevalent in federal resource investment, especially for water projects. We use the term "subsidy" here to mean a good or service provided to one person or group free or at a price substantially below either its cost or its worth. Subsidies are useful devices for achieving public ends. The American economy and society are full of them. But is the present scheme of subsidies in federal development projects rational? Are the ends sought actually achieved? Are there serious side effects?

Subsidies in federal resource development are highly variable, between one activity and another. At one extreme, beneficiaries of flood protection works pay very little of the cost involved; at the other, the investment in timber access roads is fully recovered, and more, through higher stumpage prices.

Even within water development projects, there is great difference in degree of subsidy. Hydroelectric

power, municipal water supplies, and industrial water supplies bear most or all of their costs. Irrigation is supposed to repay its costs, but repayment is spread over a 50-year period, with no interest charged. It is obvious that this results in a large subsidy. Navigation improvement and flood protection normally bear only a small share of their costs, or none at all.

Subsidies for these latter purposes were originally justified on the grounds that the benefits produced were so diffused among the whole population that it was impossible to decide who, and to what extent, benefited. Whatever truth this contention once had, it no longer fits the facts. Today it would not be impossible to determine with reasonable accuracy who benefited, and to what extent. A more practical present objection is that the federal government today would have serious difficulty, legally and politically, in collecting from the beneficiaries. If a few individuals refuse to bear their share of a project cost, the federal government is without legal means to force them to do so, although most beneficiaries might be willing to bear their share of costs. Also, large subsidies are an invitation to beneficiaries to use political power to put through projects whose total costs exceed total benefits, so long as the local benefit exceeds the local cost.

Another disadvantage of large subsidies in water development projects is that the resulting low cost invites waste of water. When irrigation water is unreasonably cheap, because the federal treasury has borne most of its cost, farmers have little incentive to conserve it. The same is true of water for other purposes. Many cities have found that the surest way to reduce water consumption is to install water meters, so that each household pays for the water it uses. You know that if water were nearly or entirely free, you would probably waste it. Ironically, more water is wasted in the West where it is scarcest; heavy subsidies to irrigation encourage such waste.

Although the federal government does not have legal powers to compel beneficiaries of water projects to pay their fair share of costs, states and local units of government do have such powers. This is done commonly by means of taxation and other charges, especially in irrigation and other local districts.

A simple arrangement would be to require states to guarantee repay-

ment of half the cost of every federal water development project. The state could make good on its guarantee by having local districts collect charges or taxes against beneficiaries, or by making such charges or taxes directly; or it could pay part or all of the guaranteed sum out of general tax revenues.

This suggestion assumes that there is a national interest equal to half the cost of the federal project. This would often not be true. Sometimes there is little or no discernible national benefit. The proposal of paying half is arbitrary, admittedly. But this would be an enormous gain over the present, when many projects repay nothing. This suggestion also assumes that there is a local benefit equal to at least half of the cost; unless it is, there is serious doubt if the project should be built at all.

State guarantees for repayment of half of costs would force major changes in flood protection, navigation, and other projects which have previously repaid little or nothing. However the necessary funds were raised, the need for substantial local repayment would exercise a sobering effect upon local enthusiasms, but would not cut out truly sound projects. The federal government would gain through some reduction in political pressures for unsound projects.

In suggestion number 5 means for strengthening state participation in water development projects were considered. The effect of that proposal would be to offer states subsidies up to 50 percent of the cost of their projects; the proposal just outlined would reduce federal subsidies for its projects to one-half of total cost. These two suggestions are uniquely complementary.

11. *Imposition of Federal Taxes to Foster Nonfederal Investment in Waste Treatment of Water*

Probably the most serious problems in federal water resource investment in the years ahead will arise out of growing stream pollution. A larger population, a greater industrial output, and atomic wastes all portend far greater pollution. The problem has already become so serious that the municipalities have sought, and obtained, federal financial aid. Yet it is probable the situation now is worse than when such aid started—the pollution load has grown faster than the remedies.

Pollution must be attacked in several ways. Regulation of industrial pollution under state authority is essential. Municipal sewage must



be treated. But a serious problem remains because under present technology some soluble substances cannot be removed through ordinary treatment practices. Dilution is necessary, and this in turn calls for storage dams and river regulation to provide an adequate stream flow to carry off the soluble and other wastes.

One basic difficulty is that there is little economic incentive to reduce pollution. Regulation, or the force of public opinion, can be and is brought to bear on industries and cities. But a definite financial reward has been lacking. This would be provided if the federal government would levy a direct tax upon all municipal or industrial water, any effluent from which reached any stream, and at the same time offer tax rebates to the degree the city or industry expended funds for pollution abatement or control. This should virtually insure a level of local effort up to the amount possible under the tax. There might be a ceiling on the latter. If such a tax were imposed nationally, industries would no longer have reason to seek locations where pollution was tolerated. To avoid too heavy an impact, the tax might be imposed gradually over a period of years, on a schedule decided long in advance.

A federal tax of this kind would be strongly opposed. If, however, there is a federal or general public interest sufficient to justify spending federal funds to help municipalities with their pollution problems, is not there a public interest in trying to reduce pollution?

12. *Adoption of Corporate-Type Operation for Some Resource Activities*

Business-type or corporate-type management arrangements could be applied to a number of federal resource activities. These could be so organized as to simplify the tasks of Congress and actually increase its ability to deal effectively with policy issues. At the same time, the various activities so included could proceed more expeditiously and in better cadence with economic forces and demands.

One specific arrangement would be the extension of the corporate-type budget to various agencies with significant revenue-producing activi-

ties. Currently, the TVA and the St. Lawrence Seaway Development Corporation follow this practice. It might be extended to the Forest Service, the Bureau of Land Management, the Bureau of Reclamation, and the power administrations of the Department of the Interior. In such a budget, revenue-producing activities which are self-supporting could be distinguished from those which are not. Where optimum revenue is the commonly accepted objective, investment programs obviously should be designed to maximize revenue to the federal government.

A second specific arrangement would be to permit certain agencies to use revenues for operation, maintenance, and investment purposes. This idea poses some delicate problems. On the one hand, such programs must be kept responsibly under control of the President, the Congress, and, ultimately, the public. On the other, if resources are to be managed with the effectiveness the economy of the future demands, resource administration must be freed of the cumbersome, time-consuming, slow, ponderous, regular budget processes.

The suggestion, however, has much promise, especially for the land managing agencies. Their revenues are large enough to provide better management than we have had in the past. Their annual expenditures are more largely for operation than investment. The dividing line between investment and current operation is not always neat for land management. Hence, a program which permitted use of revenues for both purposes would seem more logical. Some land management activities now produce much larger revenues than others. Even if prices were on a competitive basis, this would still be true, but to a lesser degree.

Should revenues from one source be used for another purpose? Under present policies power revenues from reclamation projects are used to support irrigation and a portion of land revenues are contributed to the Reclamation Fund. The present practice of crediting a substantial part of federal land revenues to the Reclamation Fund no longer has any logic. If the lands are to stand on their own feet, they cannot also sup-

port irrigation. The present practice of paying a major share of *gross* revenues from land programs to states and counties, in lieu of real estate taxes, is a particularly inhibiting force on good resource management. Direct in-lieu-of-taxes payments might well be better both to the federal government and to local governments. Under a rational system based on present-day conditions the use of revenues for operation, maintenance, and investment on public lands could produce many good results.

For water programs, the possibilities of use of revenues for these purposes are not as good, chiefly because the water programs now depend so heavily on subsidy that they cannot stand alone financially. However, some aspects of these programs, notably power, could stand alone.

A third possibility is the use of revenue bonds. This appears more practical for power developments than any other program. This device has now been applied to TVA. It might well be extended to other power programs. Possibly it could be used for timber access roads. Revenues sufficient to repay the bonds are necessary. A major advantage of this technique is that it would permit investment whenever the demand had risen to the point where the investment was profitable. Delays now so customary could be reduced or avoided.

* * * *

In these two articles we have outlined our ideas of some of the possible improvements in federal resource investment programs. We have tried to advance a number of possibilities for thought and discussion. We have refrained from setting forth a single recommended program, and from advocating it. In the final analysis, the choice is up to the informed citizens of this country, and to their elected representatives. The basic point, which we do want to make as strongly as possible, is that the present system of reaching decisions on federal resources investments is far from adequate and that with each passing year the costs of the shortcomings become higher in terms of national strength and well-being.



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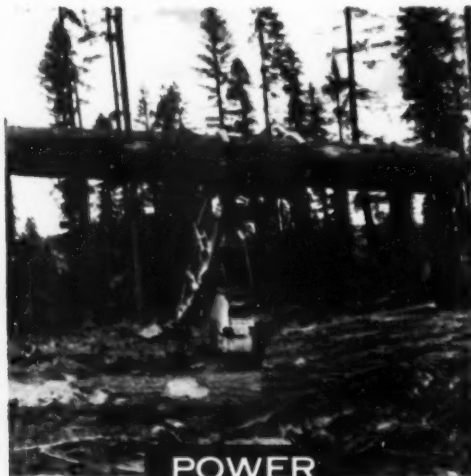
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(Cover picture shows an Eimco 106 Hydraulic Bulldozer building fire-breaks in the Clearwater Forest area in western Idaho. This machine is owned by Potlatch Forest Products, Inc.)

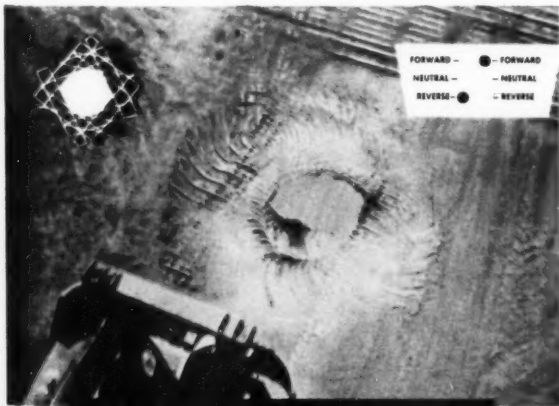
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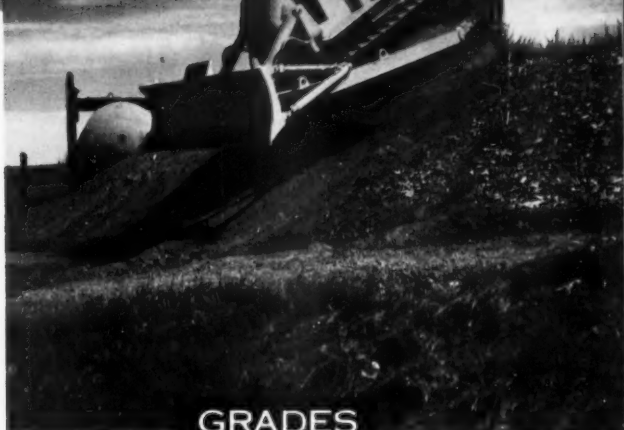
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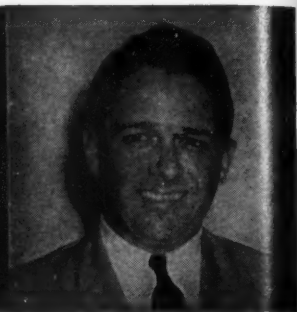


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Reading
about

RESOURCES



By MONROE BUSH

Space — The Critical Resource

EDWARD Higbee, having distinguished himself by *The American Oasis*, has followed with *The Squeeze* (William Morrow Co., 1960. \$5.95.), a hard look at the damaging mis-use of space that threatens our civilization.

Being unable to review this book myself, since I had a hand in its preparation at several stages, I have asked Robert J. Kerr II to do the job. He is eminently qualified. Following work in the history of art and architecture at both Yale and American Universities, Kerr has served as director of Urban Redevelopment for the City of Newport, R. I. and executive director of The Preservation Society of Newport County. He has taught at American University and lectured extensively throughout the country in his fields of art, architecture and urban development. His chief job, at the moment, is executive director of Historic Annapolis, Inc.—I say "chief job," for Kerr cannot help himself from keeping a dozen fingers in as many pies. His restless and inquiring mind is just what a book like Higbee's required.

The following is Mr. Kerr's review of *The Squeeze*:

The Squeeze by Edward Higbee ranges in format, subject, and anecdote from the "big-picture" of land use to the very personal question of the use of human "gray-matter." Written with a stimulating blend of factual material and subjective commentary, *The Squeeze* pin points the demand for proper utilization of our natural resources with accuracy and perception. From the problems of the utilization of urban, suburban, and rural land areas and resources to the proper utilization of human "Space Between the Ears," Dr. Higbee gives us a readable and engrossing account of our present

circumstances, of happy and unhappy efforts to meet the challenge of the population "explosion," and some thought-provoking suggestions for methods of treatment through political, economic, and social innovations.

The seriousness of the problem, and contemporary man's often ludicrous efforts in the face of growing population, diminishing natural resources, and the complications of group living and thinking have been the subject of innumerable studies and critical evaluations in recent years.

In the simplest of terms, Dr. Higbee urges that we examine our problems and plan for their solution, utilizing all of the human resources at our disposal before it is too late. His is not a new voice, crying in the wilderness of high taxation, urban decay, suburban sprawl, and human neurosis. We have all heard the call before, but perhaps we have never before been presented with such startling examples of what has happened to date and what may well happen in the future. The author illustrates our present plight through cases in point drawn from nearly every area of our vast and complex nation. Appalling as many of his descriptions of our bumbling efforts to arrive at solutions may be, the clarity and logic of his recommendations for treatment should be self-evident. High rise apartments, mass transit, a more definite attempt to order municipal growth through planned land use are certainly the logical and scientific methods of resolving our present difficulties. But man is often not logical and scientific in his approach to his world and its fast waning store of riches. At best man is a subjective creature, as Dr. Higbee points out, and has successfully

resisted efforts to bring about economies in land use, government, and exploitation of resources. An urban master plan is a good idea until *my* land is to be redeveloped or until *I* have to give up *my* automobile or until *I* have to conform to a pattern of group living or controlled movement. Most of the professional land or resource planner's devices are dependent on a re-education of man, the common denominator, to new ways of life which are, at best, foreign to traditional values.

This basic re-education must be the subject of extensive study if as a nation we are to live in relative comfort and security in the future. In many cases, as the author notes, the planner himself is at fault. Too often pat solutions to urban or suburban ills are imposed on an all too resistant body. If the planner is to be successful, he must attempt to prescribe suitable medication for the patient. He must carefully diagnose the illness first, noting peculiarities of individual character and physiognomy. When these fundamentals are known, the proper treatment can be prescribed from the vast stock of corrective measures at his disposal.

Unfortunately, in his analysis of contemporary problems, Dr. Higbee overlooks two major areas for consideration in our land and resource planning. One of these areas is that of the "special" city, the small urban center, within a metropolitan area. This small urban center faces the same general problems as his more populous neighbor. The city of 20,000 to 50,000 population is also reacting to the combination of growing population, constricted traffic patterns, economic decline and visual decay. But its situation is made more complex by the pressures on
(Turn to page 70)

These Are The Champs

Part II

IN this article we present the second, and concluding, part of AFA's fifth report on the Big Tree Campaign, but the search for new champions continues. AFA headquarters, where an up-to-date record of champions is maintained, urges members to be on the alert for trees of larger dimensions than the recorded champions. Since the last published report in 1956, 70 sovereigns have been dethroned by the discovery of larger specimens.

If you know of a tree of the same species larger than the one reported here, The American Forestry Association will appreciate having its full and accurate record as to identity of species, circumference 4½ feet above ground, its estimated height and crown spread, its state of preservation, its location and ownership. (Instructions for measuring trees will be sent upon request.) A photograph of the tree also is desired for the record.

Determination of bigness in trees listed is based on the sum of dimensions and of circumference, height and spread. To the total inches of stem circumference (4½ feet above ground) is added the total height in feet plus one-quarter of the crown spread footage. This gives a single figure denoting aggregate growth, with circumference as No. 1 factor, followed by the height and crown spread.

Champion "General Sherman"
(*Sequoia gigantea*) is 101 feet 6 inches in circumference at base

Species	Circumference at 4½ feet	Height	Spread	Location of Tree and Nominator
OAK				
xBebb, <i>Quercus bebbiana</i>	7'8"	62'	64'	Forest Park, St. Louis, Missouri. Kendall Laughlin, Chicago, Illinois.
Black, <i>Quercus velutina</i>	19'9"	90'	138'	Lloyd's Neck, L. I., New York. Mrs. E. M. Thyvaert, San Juan, Puerto Rico.
California Black, <i>Quercus kelloggii</i>	36'	---	---	Yosemite National Park, California. John B. Wosky, Yosemite National Park.
Missouri Black, <i>Quercus velutina missouriensis</i>	11'6"	62'	81'	Hyde Park, St. Joseph, Missouri. Kendall Laughlin, Chicago, Illinois.
Blackjack, <i>Quercus marilandica</i>	7'10¼"	58'	61'7"	Near Colfax, Louisiana. Herbert G. Branch, Colfax.
xBottom, <i>Quercus runcinata</i>	9'9"	85'	71'	Heathwood Park, Kansas City, Kansas. Kendall Laughlin, Chicago, Illinois.
Bur, or Mossy Cup, <i>Quercus macrocarpa</i>	20'9"	110'	107'	Algonac, St. Clair County, Michigan. Paul W. Thompson, Birmingham.
xBushes, <i>Quercus bushi</i>	8'9"	67'	59'	Forest Park, St. Louis, Missouri. Kendall Laughlin, Chicago, Illinois.
Cherrybark, <i>Quercus falcata leucophylla</i>	24'1"	110'	80'	Near Cumberstone, Maryland. S. Glidden Baldwin, Danville, Illinois.
Chestnut, <i>Quercus montana</i>	22'3"	95'	108'	Easton, Maryland. Robert G. Henry, Easton.
Swamp Chestnut, or Basket, <i>Quercus prinus</i>	21'3"	97'	117'	Near Rock Fall, Kent County, Maryland. F. W. Besley (deceased).
Chinkapin, <i>Quercus muhlenbergi</i>	19'6"	83'	80'	Near Freidensberg, Pennsylvania. Paul M. Felton, Morristown.
Dwarf Chinkapin, <i>Quercus prinoides</i>	1'4"	19'	15'	Pennsylvania State University, State Col- lege, Pennsylvania. H. H. Arnold, State College.
xDeam, <i>Quercus deami</i>	8'	85'	50'	Near Bluffton, Indiana. S. Glidden Baldwin, Danville, Illinois.
Durand, <i>Quercus durandi</i>	14'9"	139'	69'	Noxubee National Wild Life Refuge, Mis- sissippi. Eugene Cypert, Jr., Paris, Ten- nessee.
Englemann, <i>Quercus engelmanni</i>	10'3"	85'	110'	Pasadena, California. Woodbridge Metcalf, Berkeley.
xFink, <i>Quercus palaelithicola</i>	12'6"	120'	84'	Beall Woods, Rochester, Illinois. Kendall Laughlin, Chicago.
Gambel, <i>Quercus gambeli</i>	18'3"	47'	85'	Gila National Forest, New Mexico. Dahl J. Kirkpatrick, Albuquerque.
Laurel, <i>Quercus laurifolia</i>	20'	84'	102'	Darlington, South Carolina. W. J. Barker, Clemson.
Lea, <i>Quercus leana</i>	9'3"	68'	72'	Kansas City, Missouri. Kendall Laughlin, Chicago, Illinois.
Live, <i>Quercus virginiana</i>	35'	78'	168'	Near Hahnville, Louisiana. Charles Genella, New Orleans.
California Live, <i>Quercus agrifolia</i>	24'10"	108'	129'	Chiles Va Mey, Napa County, California. Woodbridge Metcalf, Berkeley.
Canyon Live, <i>Quercus chrysolepis</i>	36'3"	70'	130'	Angeles National Forest, California. G. Armstrong, Los Angeles.
Interior Live, <i>Quercus wislizeni</i>	20'	100'	100'	Near Sacramento, California. Arthur J. Teller, Del Paso Heights.
xOracle, <i>Quercus morehus</i>	8'8"	30'	40'	Between Coahuila Saddle and Juan Diego Flat, California. Donald R. Bauer, San Bernadino National Forest.
Overcup, <i>Quercus lyrata</i>	15'5"	114'	72'	Patuxent Wildlife Refuge near Laurel, Maryland. Karl E. Pfeiffer, Annapolis.
Pin, <i>Quercus palustris</i>	16'	135'	135'	Saint Davids, Pennsylvania. J. W. Ritter, Saint Davids.
Northern Pin, <i>Quercus ellipsoidalis</i>	10'	81'	65'	Linne Woods, Morton Grove, Illinois. Kendall Laughlin, Chicago.
xPorter, <i>Quercus porteri</i>	9'5"	92'	58'	Dunes State Park, Indiana. Kendall Laughlin, Chicago, Illinois.
Post, <i>Quercus stellata</i>	13'9"	80'	103'	Charlotte County Virginia. F. C. Pederson (deceased).
x <i>Quercus mutabilis</i>	10'9"	131'	68'	Big Oak Tree State Park, Missouri. Kendall Laughlin, Chicago, Illinois.

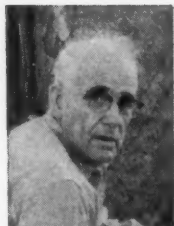
Species	Circumference at 4½ feet	Height	Spread	Location of Tree and Nominator
Red				
Eastern Red, <i>Quercus borealis maxima</i>	22'10" (at 3')	89'	55'	Conneaut, Ohio. F. H. Love, Conneaut.
Northern Red, <i>Quercus borealis</i>	24'9"	60'	---	Thorndale, Millbrook, New York. H. F. Hedgecock, Poughkeepsie.
Southern Red, <i>Quercus falcata</i>	24'1"	122'	132'	Cumberstone, Maryland. F. W. Besley (deceased).
Swamp Red, <i>Quercus falcata pagodaefolia</i>	18'6"	132'	112'	Richland County, South Carolina. Henry Savage, Jr., Camden.
Scarlet, <i>Quercus coccinea</i>	13'11"	97'	80'	Forest Hill, Maryland. F. W. Besley (deceased).
Sargent Scarlet, <i>Quercus coccinea tuberculata</i>	7'9"	75'	60'	Gatlinburg, Tennessee. S. Glidden Baldwin, Danville, Illinois.
Schneck, <i>Quercus shumardi schneckii</i>	12'6"	120'	84'	Beall Woods, Rochester, Illinois. Kendall Laughlin, Chicago.
Scrub, <i>Quercus ilicifolia</i>	1'4"	36'	12'	Pennsylvania State University, State College, Pennsylvania. H. H. Arnold, State College.
California Scrub, <i>Quercus dumosa</i>	13'5"	33'	55'	San Luis Obispo County, California. Woodbridge Metcalf, Berkeley.
Shingle, <i>Quercus imbricaria</i>	13'8"	95'	85'	Corydon, Kentucky. Henry T. Converse, Jr., Corydon.
Shumard, <i>Quercus shumardi</i>	17'5"	140'	100'	Near Keensburg, Wabash County, Illinois. Jeffrey R. Short, Jr., Chicago.
Tan—, — (see Tanoak)				
Turkey, <i>Quercus laevis</i>	7'9"	54'	55'	Maxwell's Point, Harford County, Maryland. F. W. Belsey (deceased).
Water, <i>Quercus nigra</i>	20'3"	77'	100' (diam.)	Near Center, Texas. Emory Covington, Timpson, Texas.
White, <i>Quercus alba</i>	27'8"	95'	165'	Wye Mills, Maryland. F. W. Belsey (deceased).
California White, or Valley <i>Quercus lobata</i>	27'9"	125'	---	Near Middletown, Lake County, California. Woodbridge Metcalf, Berkeley.
Oregon White, <i>Quercus garryana</i>	25'6"	120'	---	Near Mendocino National Forest, California. H. G. Abbott, Orono, Maine.
Swamp White, <i>Quercus bicolor</i>	17'9"	103'	107'	Rochester, Oakland County Michigan. Paul W. Thompson, Birmingham, and P. Sturman, Utica.
Willow, <i>Quercus phellos</i>	21'2"	118'	106'	Queenstown, Eastern Shore, Maryland. S. Glidden Baldwin, Danville, Illinois, and F. W. Besley (deceased).
OSAGEORANGE				
Osageorange, <i>Maclura pomifera</i>	19'4"	66'	7'0	Near Carmichael, Maryland. F. W. Besley (deceased).
PALM— (see Royalpalm)				
PAWPAW				
Common, <i>Asimina triloba</i>	4'9"	25'	32'	Lancaster, Pennsylvania. John D. Kendig, Manheim.
PECAN				
<i>Carya illinoensis</i>	21'4"	135'	145'	Assumption Parish, Louisiana. Sams Mims, Baton Rouge.
PERSIMMON				
Common, <i>Diospyros virginiana</i>	13'½"	80'	73'6"	Near Johnson, Indiana. W. B. Ward, Lafayette.
PINE				
Bristlecone, <i>Pinus aristata</i>	37'7"	40'	45'	Inyo National Forest, California. A. E. Noren, Bigpipe.
Coulter, <i>Pinus coulteri</i>	17'	144'	40'	Angeles National Forest, California. Will H. Thrall, Alhambra.
Digger, <i>Pinus sabiniana</i>	15'10"	155'	60'	Near Coalinga, California. Herbert S. Mund, Coalinga.
Jack, <i>Pinus banksiana</i>	6'2"	79'	27'	Near Brule, Wisconsin. John E. Borkenhagen, Gordon.

Species	Circumference at 4½ feet	Height	Spread	Location of Tree and Nominator
Jeffrey, <i>Pinus jeffreyi</i>	19'10"	151'	40'	Los Padres National Forest, California. Thomas A. Neff, Frazier Park.
Knobcone, <i>Pinus attenuata</i>	9'1"	---	---	Rogue River National Forest, Oregon. Oliver V. Matthews, Salem.
Limber, <i>Pinus flexilis</i>	24'5"	44'	50'	Cache National Forest, Utah. Wilford D. Porter, Logan.
Loblolly, <i>Pinus taeda</i>	16'6"	128'	64'	Near Ammon, Virginia. Ralph G. Turner, Amelia.
Lodgepole, <i>Pinus contorta latifolia</i>	19'	106'	---	Sierra National Forest, California. Harold S. Coons, Northfork.
Longleaf, <i>Pinus palustris</i>	10'9"	113'	40'	Autauga County, Alabama. R. M. Loughridge, Selma.
Monterey, <i>Pinus radiata</i>	13'7"	165'	75'	Near Napa, California. Woodbridge Metcalf, Berkeley.
Pinyon				
Colorado Pinyon, <i>Pinus cembroides edulis</i>	11'3"	33'	43'6"	La Sal National Forest, Utah. Owen De Spain, Moab.
Pitch, <i>Pinus rigida</i>	8'3"	97'	36'	Mays Landing, New Jersey. Bob Hirst, Northfield, and Frank Hirst, Pleasant- ville.
Pond, <i>Pinus rigida serotina</i>	7'5"	70'	48'	Near Laurel, Maryland. F. W. Belsey (deceased).
Ponderosa, <i>Pinus ponderosa</i>	27'1"	162'	---	Near Lapine, Oregon. Donald F. McKay, Tacoma, Washington.
Red, or Norway, <i>Pinus resinosa</i>	8'10"	98'	34'	Stephenson, Wisconsin Edward Steigerwaldt, Tomahaw.
Shore, or Coast, <i>Pinus contorta</i>	9'1"	---	---	Curry County, Oregon. Oliver V. Matthews, Salem.
Shortleaf, <i>Pinus echinata</i>	10'7"	146'	60'	Morganton, North Carolina. A. H. Maxwell, Morganton.
Spruce, <i>Pinus glabra</i>	13'6"	105'	60'	Near Brookhaven, Mississippi. Monty Payne, State College.
Sugar, <i>Pinus lambertiana</i>	32'8"	220'	61'	Stanislaus National Forest, California. J. R. Hall, Sonora.
TableMountain, <i>Pinus pungens</i>	6'10"	---	---	Chattahoochee National Forest, Georgia. C. A. Rowland, Jr., Gainesville.
Torrey, <i>Pinus torreyana</i>	17'	100'	118'	Carpenteria, California. Edward H. Scanlon, Santa Monica.
Virginia, <i>Pinus virginiana</i>	7'5"	81'	39'	Near Grayton, Charles County, Maryland. Robert H. Rumpf, Fredericksburg, Va.
White				
Eastern White, <i>Pinus strobus</i>	17'2"	140'	56'	Near Newald, Wisconsin. Jacque D. Vallier, Milwaukee.
Western White, <i>Pinus monticola</i>	21'3"	219'	36'	Near Elk River, Idaho. A. B. Curtis, Boise.
Whitebark, <i>Pinus albicaulis</i>	19'	85'	60'	Grand Teton National Park, Wyoming. Charles J. Smith, Moose.
PLANETREE: SYCAMORE				
American, <i>Platanus occidentalis</i>	32'10"	80'	102'	Near South Bloomfield, Ohio. Charles M. Wheldon, Worthington.
California, <i>Platanus racemosa</i>	27'	116'	158'	Near Santa Barbara, California. Maunsell Van Rensselaer, Saratoga.
PLUM				
American, or Wild, <i>Prunus americana</i>	5'	29'	33'	Near Steyer, Maryland. Karl E. Pfeiffer, Annapolis.
Canada, <i>Prunus nigra</i>	4'	41'	48'	Ferndale, Oakland County, Michigan. Paul W. Thompson, Birmingham.
Inch, <i>Prunus lanata</i>	1'10"	26'	24'	Ouachita National Forest, Arkansas. Alan M. Anderson, Hot Springs, National Park, and Kenneth Laughlin, Chicago, Illinois.
POISONSUMAC				
<i>Toxicodendron vernix</i>	1'9"	25'	18'	Blathleyville, Ohio. Roger Troutman, Wooster.
POPLAR; COTTONWOOD				
Balm-of-Gilead P., <i>Populus candicans</i>	11'11"	89'	78'	Near Cornell, Delta County, Michigan. Jacob Broderson, Ralph.

Species	Circumference at 4½ feet	Height	Spread	Location of Tree and Nominator
Eastern P., <i>Populus deltoides</i>	30'	90'	---	Fort Kearney, Neb. V. W. Binderup, Minden.
Gray P., <i>Populus canescens</i>	18'4"	125'	170'	Near Weston, Missouri. Edgar Linton, Kansas City.
Michaux Tacamahac, <i>Populus tacamahaca michaux</i>	8'1"	84'	48'	Turnbull Woods West, Glencoe, Illinois. Kendall Laughlin, Chicago.
Narrowleaf P., <i>Populus angustifolia</i>	6'	55"	25'	Little Cottonwood Creek, Pueblo Mountains, Oregon. Oliver V. Matthews, Salem.
Pacific P., or Northern Black C., <i>Populus trichocarpa hastata</i>	28'8"	78'	95'	Near Menlo, Washington. John Rysted, South Bend.
Southern P., <i>Populus deltoides missouriensis</i>	21'7"	124'	115'	Near Geneva, N. Y. O. E. Files, Toledo, Ohio.
Swamp, P. or C., <i>Populus heterophylla</i>	26'	100'	---	Seneca, South of Tiffin, Ohio. James E. Crider, Columbus.
White P., or Silver P., <i>Populus alba</i>	21'9"	76'	97'	Near Spring Arbor, Jackson County, Michigan. Paul W. Thompson, Birmingham.
Yellow P.—(see Tuliptree)				
POSSUMHAW				
Possumham, <i>Ilex decidua</i>	1'1"	20'	27'	Big Oak Tree State Park, Missouri. Kendall Laughlin, Chicago, Illinois.
PRICKLYASH				
Common, <i>Zanthoxylum americanum</i>	1'4" (base)	30'	---	Homochitto National Forest, Mississippi. Herbert P. Rice, Rolling Fork.
Hercules club, <i>Zanthoxylum clavaherculis</i>	4'4" (base)	50'	---	Homochitto National Forest, Mississippi. Herbert P. Rice, Rolling Fork.
REDBUD				
Eastern, <i>Cercis canadensis</i>	9'7"	35'	33'	Saline, Michigan. A. B. McKinstry, Jr., Livonia.
REDCEDAR				
Eastern, <i>Juniperus virginiana</i>	13'4"	62'	42'	Cumberstone, Queene Anne County, Maryland. F. W. Belsey (deceased), and S. Glidden Baldwin, Danville, Illinois.
REDWOOD—(see also Sequoia)				
Redwood, <i>Sequoia sempervirens</i>	65'9" (at 6')	300'	---	Big Tree Park on Redwood Highway, California. John A. McGregor, San Francisco.
RHODODENDRON				
Coast, <i>Rhododendron macrophyllum</i>	2'5"	27'	27'	Honeyman State Park, near Florence, Oregon. F. LeRoy Spangler, Medford.
ROYALPALM				
Cuban, <i>Roystonea regia</i>	4'9"	100'	12'	Collier Seminole State Park, Naples, Florida. Wilbur F. Smith, South Norwalk, Connecticut.
SASSAFRAS				
Common, <i>Sassafras albidum</i>	16'	88'6"	68'	Owensboro, Kentucky. Mrs. O. W. Rash, Owensboro.
Silky, <i>Sassafras albidum molle</i>	15'4"	65'	47'	Near Mt. Nebo, Lancaster County, Pennsylvania. Ray Brooks, Landisville.
SEQUOIA—(see also Redwood)				
Giant, <i>Sequoia gigantea</i>	101'6" (base)	272'	90'	Sequoia National Park, California. Miss Isabelle F. Story, Washington, D. C.
SERVICEBERRY				
Alleghany, <i>Amelanchier laevis</i>	3'10"	41'	42'	Near Highland, Oakland County, Michigan. P. W. Thompson, Birmingham.
Pacific, <i>Amelanchier florida</i>	2'9"	---	---	Near Lyons, Oregon. Oliver V. Matthews, Salem.
Shadblow, <i>Amelanchier canadensis</i>	8'6"	50'	50'	New Philadelphia, Ohio. John Zimmerman, Gnadenhutten.
SILVERBELL				
Mountain, <i>Halesia monticola</i>	11'9"	---	---	Great Smoky Mountains National Park, Tennessee. Stanley A. Cain, Knoxville.
SOAPBERRY				
Western, <i>Sapindus drummondi</i>	5'6"	51'	46'	Carnegie, Oklahoma. Floyd Clay, Alfalfa.

Species	Circumference at 4½ feet	Height	Spread	Location of Tree and Nominator
SOURWOOD				
Sourwood, <i>Oxydendrum arboreum</i>	7'4"	65'	35'	Pisgah National Forest, North Carolina. James Hutchins, Burnsville.
SPICEBUSH				
Common, <i>Lindera benzoin</i>	7"	19'	19'	Near Three Oaks, Michigan. P. W. Thompson, Birmingham.
SPRUCE				
Black, <i>Picea mariana</i>	3'¾"	58'	24'	Near Florence, Wisconsin. E. V. Falasky and L. R. Lacasse, Tomahawk.
Brewer, <i>Picea breweriana</i>	12'2"	---	---	Near Miller Lake, Oregon. Oliver V. Matthews, Salem.
Colorado, or Blue, <i>Picea pungens</i>	11'9"	123'	---	Gunnison National Forest, Colorado. Fred R. Johnson, Denver.
Engelmann,, <i>Picea engelmanni</i>	19'11"	104'	30'	Cache National Forest, Idaho. Jay B. Hann, Paris.
Red, <i>Picea rubens</i>	14'1"	75'	---	Great Smoky Mountains National Park, North Carolina. Verne Rhoades, Asheville.
Sitka, <i>Picea sitchensis</i>	51'6"	180'	50'	Olympic National Park, Washington. Robert L. Wood, Poulsbo.
White, <i>Picea glauca</i>	10'1"	75'	42'	Near Herbster, Wisconsin. Charles E. Rieck, Hayward.
Alberta White, <i>Picea glauca albertiana</i>	8'6"	70'	---	Black Hills, South Dakota. Robert J. Arkins, Rapid City.
SUMAC				
Flameleaf, <i>Rhus copallina</i>	11"	20'	14'	Dunes State Park, Indiana. Kendall Laughlin, Chicago, Illinois.
Poison—(see Poisonsumac)				
Smooth, <i>Rhus glabra</i>	2'6" (base)	45'	---	Homochitto National Forest, Mississippi. Herbert P. Rice, Rolling Fork.
Staghorn, <i>Rhus typhina</i>	3'4"	26'	26'	Clawson, Michigan. H. DeVries, Clarkston.
SWAMP-PRIVET—(see Forestiera)				
SWEETGUM				
American, <i>Liquidambar styraciflua</i>	16'11"	112'	71'	New Madrid, Missouri. Kendall Laughlin, Chicago, Illinois, and R. E. McDermott, Columbia, Missouri.
SYCAMORE—(see Planetree)				
TAMARACK—(see Larch)				
TAMARIND				
Wild—(see Lysiloma)				
TANOAK				
Tanoak, <i>Lithocarpus densiflorus</i>	24'1"	80'	84'	Near Cazadero, Sonoma County, California. Arnold F. Wallen, Oakland.
TORREYA				
California, or California-nutmeg <i>Torreya californica</i>	14'10"	141'	39'	Near Mendocino, California. Edward Simons, San Francisco.
TULIPTREE: YELLOW POPLAR				
<i>Liriodendron tulipifera</i>	26'6"	83'	98'	Annapolis, Maryland. F. W. Besley (deceased).
TUPELO				
Black T., or Blackgum, <i>Nyssa sylvatica</i>	13'3"	85'	83'	Sandy Spring, Maryland. F. W. Besley (deceased).
Water, <i>Nyssa aquatica</i>	18'1"	110'	65'	Near Camden, South Carolina. Henry Savage, Jr., Camden.
VIBURNUM				
Blackhaw, <i>Viburnum prunifolium</i>	1'9"	20'	18'10"	Glen Mills, Pennsylvania. S. Glidden Baldwin, Danville, Illinois, and T. V. Palmer, Concordville, Pennsylvania.
Rusty Blackhaw, <i>Viburnum rufidulum</i>	2'2"	23'	21'	Big Oak Tree State Park, Missouri. Kendall Laughlin, Chicago, Illinois.
Nannyberry, <i>Viburnum lentago</i>	5'	22'	35'	State College, Pennsylvania. H. H. Arnold, State College.
WAHOO				
Eastern W. or Eastern Burningbush, <i>Euonymus atropurpureus</i>	1'2"	12'	5'	Turkey Run State Park, Indiana. Kendall Laughlin, Chicago, Illinois.

Species	Circumference at 4½ feet	Height	Spread	Location of Tree and Nominator
WALNUT				
Black				
Arizona Black, <i>Juglans major</i>	9'10"	55'	52'	Near Albert, Oklahoma. Floyd Clay, Alfalfa.
Eastern Black, <i>Juglans nigra</i>	20'3"	108'	128'	Anne Arundel County, Maryland. F. W. Besley (deceased).
Hinds Black, <i>Juglans hindsii</i>	18'7"	95'	---	Near Arbuckle, California. Woodbridge Metcalf, Berkeley.
White—(see Butternut)				
WATERELM				
Waterelm, <i>Planera aquatica</i>	2'8"	26'	29'	Mississippi County, Missouri. Kendall Laughlin, Chicago, Illinois.
WAXMYRTLE				
Pacific or California, <i>Myrica californica</i>	3'11"	---	---	Near Annapolis, California. Richard H. May, Berkeley.
WILLOW				
Babylon Weeping, <i>Salix babylonica</i>	13'5"	101'	88'	Detroit, Michigan. Miss Betty Larson and Mrs. F. Martin, Detroit.
Bebb, <i>Salix bebbiana</i>	2'½"	31'	18'	Near Maple City, Michigan. P. W. Thompson, Birmingham.
Black, <i>Salix nigra</i>	26'1"	85'	79'	Traverse City, Michigan. Howard Harvey, Acme.
Brittle, <i>Salix fragilis</i>	18'7"	70'	80'	Old Westbury, L. I., New York. George H. Peters, Freeport.
Coastalplain, Ward, <i>Salix longipes wardii</i>	2'11"	18'	25'	Glenwood, Arkansas. Kendall Laughlin, Chicago, Illinois.
Hooker, <i>Salix hookeriana</i>	9'10"	42'	40'	Near Cannon Beach, Oregon. George M. Hansen, Portland.
Peachleaf, <i>Salix amygdaloides</i>	6'9"	77'	51'	Black Partridge Woods, Cook County, Illinois. Kendall Laughlin, Chicago.
Pussy, <i>Salix discolor latifolia</i>	3'7"	30'	31'	Chechupinqua Woods, Chicago, Illinois. Kendall Laughlin, Chicago.
Sandbar, <i>Salix interior</i>	1'1"	24'	14'	Schiller Woods, Cook County, Illinois. Kendall Laughlin, Chicago.
Scouler, or Mountain, <i>Salix scouleriana</i>	9'5"	---	---	Silver Creek Falls State Park, Oregon. Oliver V. Matthews, Salem.
Shining, <i>Salix lucida</i>	5'9"	58'	51'	Traverse City, Michigan. P. W. Thompson, Birmingham.
White, <i>Salix alba</i>	26'2"	60'	110'	Near Ashtabula, Ohio. Mrs. Herbert D. Root, Austinburg.
Yellowstem White, <i>Salix alba vitellina</i>	30'7"	58'	96'	Near Commerce, Oakland County, Michigan. Paul W. Thompson, Birmingham.
WINTERBERRY				
Common, or Michigan Holly, <i>Ilex verticillata</i>	6½"	33'	8"	Near Decatur, Van Buren County, Michigan. Paul W. Thompson, Birmingham.
Mountain, <i>Ilex montana</i>	1'2"	18'	8"	Great Smoky Mountains National Park, Tennessee. S. Glidden, Baldwin, Danville, Illinois.
WITCHHAZEL				
Common, <i>Hamamelis virginiana</i>	2'1"	25'	25'	Windom, North Carolina. James Hutchins, Windom.
YAUPON				
American, <i>Ilex vomitoria</i>	8"	18'	11'	Hot Springs National Park, Arkansas. Kendall Laughlin, Chicago, Illinois.
YELLOWWOOD				
American, <i>Cladrastis lutea</i>	6'	72'	67'	Grosse Pointe, Mich. Ed Eichstadt, Detroit, and P. W. Thompson, Birmingham.
YEW				
Pacific, <i>Taxus brevifolia</i>	14'8"	59'5"	57'	Near Mineral, Lewis County, Washington. Bruce Malcolm, Lenard Barnhouse,, August Storkman and Roger Levitt, Tacoma.
YUCCA				
Joshuatree, <i>Yucca brevifolia</i>	12'6¼"	32'	37'	Joshua Tree National Monument, California. Samuel A. King, Twentynine Palms.
xHybrid				



Dr. Clarence Cottam, left, director of the Welder Foundation, is nationally recognized in the field of game management. He worked for the U.S. Fish and Wildlife Service for 25 years. Later, Dr. Cottam was the dean of the College of Biology and Agriculture, Brigham Young University



Here's to Better Hunting

By CLEVELAND VAN DRESSER

ON a small (for Texas) tract of land 30 miles north of Corpus Christi, wildlife management experiments are being conducted that already have and will continue to have ever increasing beneficial effects on hunting, and to a lesser degree fishing, on some 100 million acres of grazing and cattle land from Louisiana north to the Dakotas and west to California, Oregon and Washington.

The tract of land is known as the Rob and Bessie Welder Wildlife Foundation and came into being after Mr. Welder died on December 31, 1953. His will decreed that "a small tract of my ranch, some 8,000 acres, be set aside to further the education of people throughout the world in conservation, the blessings of wildlife and the relation of wildlife to domestic animals on our ranches and farms; and to perform, foster and encourage study and scientific research related to wildlife propagation associated with the raising of livestock and domestic animals."

Today the Welder Wildlife Foundation is a booming going concern with administration and office buildings, quarters for students and visiting officials who come from all over the United States, Canada and England, laboratories, an auditorium, residences for the director and assistant director and other necessary buildings. Practically the whole establishment is air conditioned.

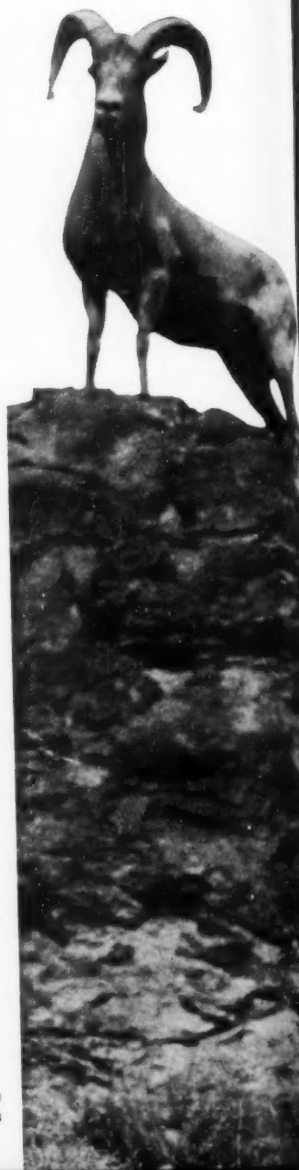
What was once just a small part of the huge Welder ranch (one of the largest southern Texas has ever known) is now one of the most effi-

cient outdoor and indoor wildlife management laboratories anywhere in the world.

The refuge abounds with wild turkey, deer, quail, doves, and peccary (wild pig), as well as bobcats, coyotes, possum, coons, jack and cottontail rabbits, armadillos, and even a few wolves. The waterfowl contingent, both resident and migrant, includes mallards, pintails, all three members of the teal family, fulvous, black bellied and mottled ducks, coots, gallinules, and grebes. The last six members of waterfowl species nest in varying numbers on the 400 acres of ponds and lakes on the area. In addition, snow, blue, and Canada geese, wood ibis, herons, and egrets either stop off at Welder or spend the winter there. Last winter two whooping cranes paid a short visit to Welder. The non-game bird population is fantastic, both in numbers and species—400 different species having been recorded so far.

As a matter of fact, the Welder refuge occupies a peculiar geographical position. It is the southernmost range of northern types of flora and fauna, as well as the northernmost range of southern types of plant and animal life. In addition, east and west meet on a common, but limited ground. As an example of this, I saw six eastern black ducks, yellow legs and all, during my visit there early last fall.

The director of the Welder Foundation is Dr. Clarence Cottam, whose name is a byword in the field of game management, zoology and biology. Most sportsmen know Dr. Cottam worked for the U. S. Fish and



Big horn sheep are supported on cattle ranches in Colorado, Nevada, Arizona

Wildlife Service, (including the old Biological Survey) for 25 years, and was acting director for several years during the early 1950's. Prior to coming to Welder in July, 1955, Dr. Cottam was dean of the College of Biology and Agriculture at Brigham Young University. Caleb Glazener, 15 years with the Texas Game and Fish Commission, is assistant director. A small crew of highly trained scientists comprises the technical staff.

The main purpose of the Welder Wildlife Foundation is to establish the fact that cattle raising not only can be pursued along with a high wildlife population, but can be improved and made more profitable. Rob Welder, being a practical man, left ample provision for funds to run the refuge that bears his name. Ten producing oil wells are on the property and the royalties from these furnish part of the necessary finances.

Let it be understood the Welder Wildlife Foundation is no secluded tract of land protected from every man-made and natural hazard where in deer, wild turkey and quail live and reproduce unmolested. True, no hunting is allowed on Welder, but every other danger to wildlife is present. Coyotes, wolves, bobcats, snakes, hawks, owls, skunks, and other predators are present in abundance, and little effort is made to control them. Besides the oil wells, there are eight gas pipe lines running through the property that require regular manual attention. In addition to the personnel at the refuge, representatives of 7 different services have access to the area. Indeed, the Welder wildlife sanctuary is far from a remote retreat. Nevertheless, the whistle of the bob white and the gobble of the turkey is heard on every side, and if you're not careful, you're liable to run over a deer as it takes a late evening stroll along a road.

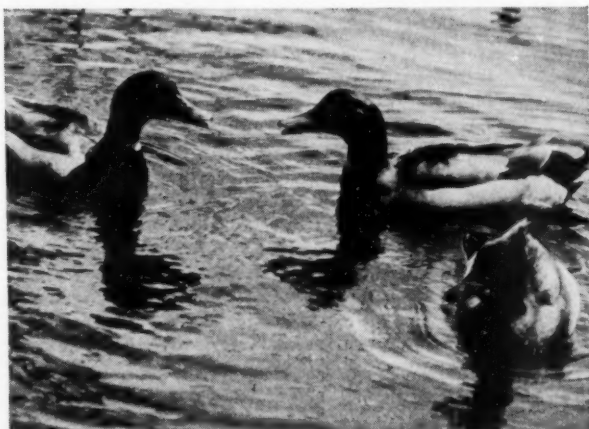
As the purpose of the foundation is to prove and demonstrate that cattle raising and the production of wildlife can be carried on at the same time, there is a sizable herd of Hereford cattle on the refuge. A crew of experienced Mexican cowhands tends the herd, and the game sanctuary has the required number of loading pens and chutes, feed boxes for "weaners" and other equipment necessary for the profitable raising of cattle. The animals roam over the terrain almost at will, bothering the deer, turkey and other wild birds and animals not a whit. The herd varies in size from season to season,
(Turn to page 63)



A bull elk wanders through forest in Montana. Cattle ranches in Montana, Idaho, and other northwestern states support elk



Wild turkeys are plentiful on refuge. No hunting is allowed on refuge but every other danger to wildlife is present here



Mallard ducks are part of the waterfowl contingent at the Welder Refuge, which includes some 400 acres of ponds and lakes



James K. Carr, an active member of AFA, gets sub-Cabinet post

CARR NAMED UNDER SECRETARY OF INTERIOR

JAMES K. CARR, chairman of the California Water Commission and an assistant general manager of the Sacramento Municipal Utility District, was named Under Secretary of Interior by President Kennedy last month. The 47-year-old Californian had been recommended for the Interior Department post by Governor Edmund G. Brown, U. S. Senators Clair Engle and Thomas H. Kuchel, Congressman John E. Moss, and several other members of the Senate and House of Representatives, as well as by western water and power leaders.

In commenting on the new posi-

tion, Carr said, "Naturally, I consider it an honor, a challenge, and a heavy responsibility to be appointed Under Secretary of the Department of the Interior. There are countless important and interesting problems to be solved. . . . I am looking forward to working closely with Secretary Udall in an aggressive and affirmative program for the conservation and prudent use of the nation's resources."

Carr is well equipped for his new position, having had extensive experience in both state and federal government activities in the natural re-

sources field. He is also a nationally recognized authority on the conservation and development of natural resources.

Carr has been a professional civil engineer for 25 years. He began his engineering and administrative career as a junior engineer at Shasta Dam on the Central Valley Project, where he served for 15 years. Then he served as an engineering consultant to the Committee on Interior and Insular Affairs of the House of Representatives in Washington, D. C. for three years. He returned to California to work for the Sacramento Municipal Utility District. While with the Utility District, he played a prominent part in bringing the District's \$100 million Upper American River hydroelectric project to the construction stage. More recently, he has been in charge of public and governmental relations for the District.

Press reports have been enthusiastic about Carr's Interior appointment. *The Chico Enterprise-Record* (California) editorialized, "Public officials and citizens who have devoted their time and energies to efforts on behalf of irrigation, reclamation, flood control, conservation and other water development and natural resources programs over the years are agreed that Kennedy couldn't have picked a better man to help conduct the Interior Department's important program. . . ."

"One of the most valuable services rendered to the Mid-Valley area by Jim Carr was the advisory work he performed during the early stages of the Sacramento Valley Canals Project. His knowledge and advice regarding both engineering and political aspects of the important project were invaluable as citizen members of the project committee worked for congressional authorization and eventual construction appropriations.

"In addition, the people of the valley know Jim Carr as a man with a human touch and a high regard for the interests of his fellow man. For example, as one of the engineers during construction of massive Shasta Dam, Carr was the father of the idea to construct the road which now provides the invaluable scenic approach to the magnificent dam site. In another similar action, Carr was responsible for the planting of two million young pine trees on the hill-sides near the dam made barren when copper smelter fumes in early mining days had killed off the vegetation. . . ."

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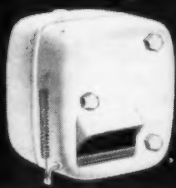
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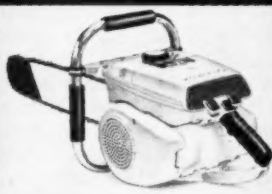
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LEADERSHIP THROUGH CREATIVE ENGINEERING



Management of Small Woodlots In Sweden

(From page 19)

regions comprising a number of local Forest Owners' Associations and the corresponding forest industries. In this way it is possible for the small forest owner to sell such small lots of wood—a few hundred cubic feet—that otherwise could not be put on the market. At the same time it saves the forest industries the cost of dealing with a great number of small sellers. This is such a great advantage to the buyers that they are willing to pay a commission to the Forest Owners' Association. The amount thus received is the principal source of income the associations have to cover their expenses. Besides, their members have to pay a membership fee to the associations, determined by the acreage of their forest, which provides the working capital for the associations.

Eventually the Forest Owners' Associations extended their activities into several new fields. Most important is their well organized work to help their members with small holdings to overcome the disadvantage in harvesting their timber. In this field a rapid development towards mechanization has taken place on private and state forests. This has been prompted by increasing scarcity of labor and rising wages. Even if the small forest owners do some of their logging themselves, they are increasingly dependent upon hired labor and the accompanying rising costs, which tend to reduce the stumpage value from their fellings. The associations have done much to provide forest owners with suitable machinery such as motor saws, barking machines and heavy tractors for road building, etc., and, if necessary, with skilled labor.

Great efforts are being made to inform and instruct the forest owners about new tools and machinery. Demonstrations of equipment are met with lively interest. Much can be lost by not cutting the trees into sawlogs and pulpwood in the most economical way, and thus the instruction of the forest owners in this respect is given much attention. The proper storage of the logs in the woods and on the landings to avoid deterioration is another important aspect of logging given close attention.

The last important stage is the acquisition of processing industries by the associations. The purchase and rebuilding of sawmills has been fol-

lowed by the acquisition of pulp and paper mills in southern Sweden, and lately by the building of a big cellulose mill with a capacity of 80,000 tons a year. Construction has been started on another mill of the same capacity, also in southern Sweden, and plans are underway to extend these activities to northern Sweden.

Lately the Forest Owners' Associations have also been active in stimulating their members in practicing good forestry. Suitable machinery for scarification of the soil to facilitate natural regeneration may be hired by the forest owners and trained planting crews are furnished. (This, by the way, is also done by the County Forestry Boards.) An intensive publicity campaign is carried on based on the fact that the small forests belonging to the farmers should not be less well managed than the company forests.

There is no question but that the Forest Owners' Associations have been a powerful instrument in improving the management of the small forest holdings. They have helped the small forest owners to obtain a higher income from their forests, not only by strengthening their bargaining position with the buyers, but also by making the harvesting of their timber crop increasingly efficient and economical. The improvement of stumpage values thus realized should increase interest in silviculture and further increase the yield from the forests. The associations have also actively promoted sound forestry practices with the small forest owners. This has been done in excellent co-operation with the County Forestry Boards.

What, then, are the possibilities and limitations of the Forest Owners' Associations to further improve the management of small forest holdings?

First, this is a question of the number of members these associations can eventually attain. For the present 58 per cent of the total forest area belonging to private forest owners, with a corresponding membership of 126,000, is enrolled in these associations. Membership growth has now slowed down, and it does not seem likely that the associations will become very much larger if new activities to arouse the interest of reluctant or disinterested forest owners are not initiated. There

may be several reasons for forest owners not joining the associations. One reason is the obligation for the members to sell all their wood products through the associations.

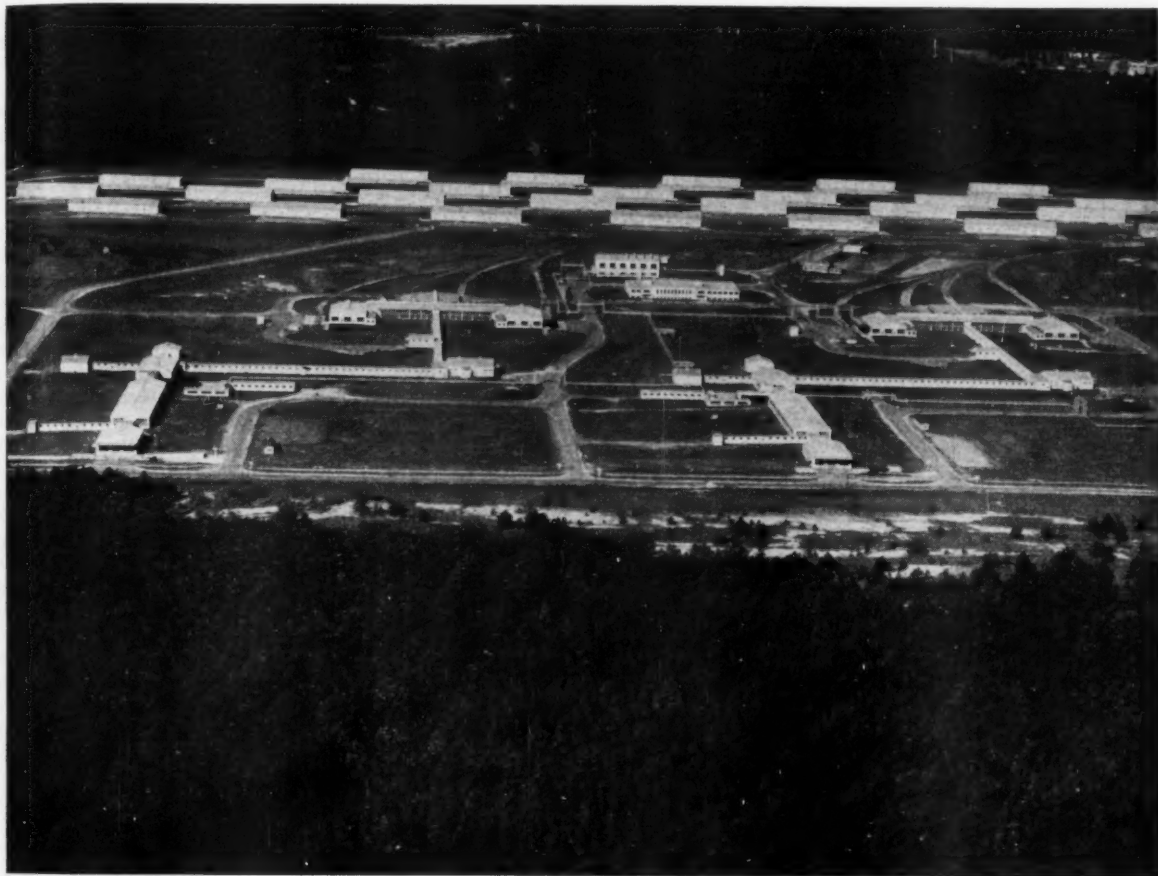
Even with a much greater enrollment in the forest owners' associations, there are still some limitations to their possibilities to overcome the disadvantages of the small holdings, and the passive or even negative attitude of some forest owners toward investment in silvicultural measures. The principal remaining deterrent is the scattered nature of the small holdings which are generally split up in two or more separate woodlots. This prevents the concentration of transportation or planting and other forestry activities such as logging, silvicultural work, in certain areas each year, which is a main advantage to the big forest holdings. It also makes it difficult to employ at full advantage more expensive machinery as well as skilled labor and trained personnel. The solution to this remaining hindrance to good management of small forest holdings, so far as a solution can be attained by maintaining present ownership, has been sought by the creation of Forest Co-operatives.

Forest Co-operatives

While prices of the forest products in recent years have remained at the same level or even declined, the rising cost of labor and other costs in forestry have made the economy gradually less favorable for the small forest owners who must depend upon hired labor and lack the means of the big forest owners to reduce cost by mechanization.

Also labor has become increasingly difficult to obtain for temporary work such as logging, as skilled labor can obtain year around employment on contract in company and state forests. Thus, only unskilled labor at higher wages than those on a permanent employment basis can as a rule be had on the small forest holdings. This means less good work at higher pay with the prospects that things will gradually grow worse.

In this situation a closer co-operation between the small forest owners than could be provided by the Forest Owners' Associations in their present form seemed to be the natural solution, insofar as this could bring about the same conditions for efficient management on the small



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holdings as is the case on the big forest holdings owned by the state and the companies. As a result of such deliberations, the first Forest Co-operative was created in 1955 in Jaemtland County in northern Sweden.

The leading principles for Forest Co-operatives are the following:

The co-operative in itself is no legal party. The members of a co-operative sign a contract with the Forest Owners' Association of the region to become members of the association and sell all their forest products through the association. The association in turn places at the disposal of the members of the co-operative a specially trained forester, called forest inspector, who is usually a graduate from a rangers' school. This man, as a leader and adviser of the Forest Co-operative, should have thorough knowledge of forest management and an open mind for efficient operations and co-operation. Besides the forest inspector, an assistant may be employed to supervise and direct the forest work, etc. The members pay for this personnel only to the extent that they call for their services. In some co-operatives

the members pay a yearly fee according to the acreage of their holdings besides a somewhat reduced cost of employing the services of the personnel. These personnel are paid by the Forest Owners' Associations, and are to be considered employees of the association.

Acting as liaison between the co-operative and the Forest Owners' Association is a group of five to seven members, one of them being appointed by the association and the rest being chosen by the members of the co-operative. Besides serving as a contact between the association and the co-operative, this body determines the expenditures from the special fund belonging to the co-operative which is intended to serve common purposes that cannot be charged to the individual members.

The association employs forest workers on a permanent basis and provides housing for them. It also provides additional forest labor in the logging season so far as this is necessary. Any member who wants to do his forest work himself or to work for his neighbors is, however, free to do so.

The co-operatives are organized in

a very flexible way, which makes it possible to serve the needs of the members on an individual basis. The minimum contribution of each member, which goes into the common fund, which goes to 2 per cent of the sales value of forest products sold or 4 per cent of the stumpage realized, if the sale has been done on the stump.

It is desirable that even such members who do not require the services of the personnel of the co-operative take part in planning the forest work on the co-operative level. They consider where logging operations by different owners should be located each year in order to get the lowest cost of transportation, of workers' rest houses, etc. Such planning eliminates the disadvantages of small and scattered holdings and helps the co-operative function as one working unit. This planning on the co-operative level is co-ordinated with planning for the individual forest holdings, which is made more efficient by the aid of simple work schedules recommending certain fellings and corresponding silvicultural measures.

Such members that want to can have their timber harvested wholly

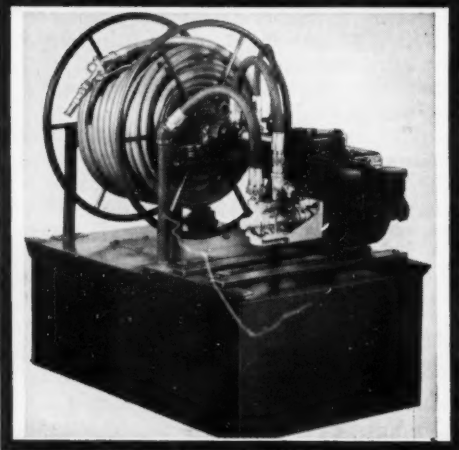


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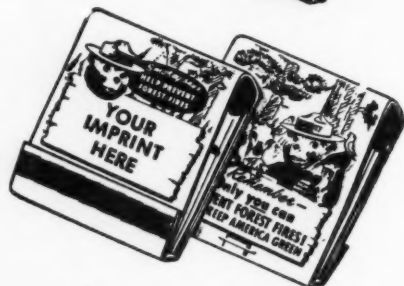
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by the co-operative at a reasonable cost (about one cent per cubic foot), which reimburses the association for the use of the services of the personnel. The cost of labor incurred will be charged to the member's account with the association. He can thus receive the net income from his forest without any activity whatsoever of his own. The necessary silvicultural work, such as planting after felling, can in the same way be executed by the association and charged to the account of the member concerned. In principle, a member never pays for anything in cash but all costs are charged to his account, and in this connection reported in detail, thus enabling him to discuss with the forest inspector ways and means to increase efficiency. A forest owner can even leave the entire management to the leader of the co-operative, which is rather convenient for those not living on their property.

It is interesting to note that the investments in planting and other silviculture measures are greater on the co-operatives than on other private forests in the same region. In the case referred to such investments amount to about 40 cents per acre a year corresponding to about 15 per cent of the stumpage value realized from felling. The corresponding percentage for the total forest area in the county as a whole is about seven.

In conclusion, it can be said that the Forest Co-operative represents an extension of the service rendered by the Forest Owners' Associations to its members. As mentioned already, the members of the co-operative are also members of the association and pledge themselves to sell all their forest products through the association. The flexible nature of the co-operative allows a greater margin for meeting individual needs and wishes. At the same time it permits the members that want to exercise their own management of their holdings free access to discuss their problems with a professional man. This explains the great popularity this kind of co-operative has attained. In the short time Forest Co-operatives have been in existence they have experienced a very rapid growth, considering that the recent years have been devoted primarily to trying out this new form of co-operative. At the present time there are 40 Forest Co-operatives which include a total area of nearly half a million acres and have a total membership of 2800 forest owners. This corre-

sponds to 70 members with a total forest area of about 12,000 acres on an average for each co-operative. Altogether 400 permanent forest workers are employed.

The experience gained so far is very encouraging. The fundamental problem of combining the advantages of the big forest holdings with the valuable self-interest of the individual owners seems to have found a solution in the Forest Co-operative that offers a solid foundation for the management of small forest holdings in private ownership.

There will of course be limitations

to this form of co-operative also. There will always be forest owners that for different reasons will not join a Forest Co-operative just as they will not join a Forest Owners' Association. However, many forest owners not wishing to join the co-operative at the start have found out how useful it can be for them.

There is one important limitation to the success of the Forest Co-operative as an idea or principle for promoting management on small forest holdings. It cannot be started as an isolated unit, regardless of the en-



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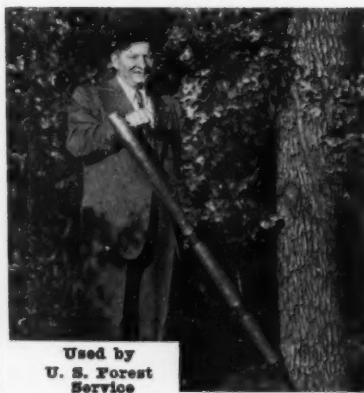
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vironment. It is indeed fundamental that it should be well fitted into its environment. This environment is not only made up by the natural and economic conditions in question, it is also to no small degree a result of past developments, reflecting the shape of tradition and molding the

Fog and Lava Rock, Pines and Pineapples

(From page 11)

sun shines on this black rock, it heats up, and the thin film of moisture near the surface is soon lost. (Pahoehoe is another form of lava, sheet like and almost impervious to water, plants, and conversion.)

Lava breaks down into soil quite rapidly where the rains are heavy and frequent. But along the arid shorelines and in the dry uplands, there is not sufficient rain for a luxuriant plant cover which through the downward pushing roots and the resultant organic matter would break down the lava into soil.

Lava areas along the shoreline may someday be modified, if we have enough money. We can help nature do this by using bulldozers to level these black fields, then roll the rock, breaking it down to smaller rocks and some dust. We can do more by then bringing in soil and covering leveled areas. After this, with a little irrigation, grass, trees, and weeds grow fast and green. This type of land conversion is very costly and can only be justified when it ties into facilities for the tourist trade, hotels, and homesites.

Lava areas, in the highlands, above the heavy rainfall belts, where the fog sweeps over the land through much of the year may be changed from black to green, barren to timber covered. The Lanai experiment prompts the answer: why not grow pine trees to trap the fog? There are problems, but the payoff should be worth the effort.

Ash trees, *Fraxinus uhdei*, native to Mexico, were planted in the black lava in 1959. A year later some of these trees were 4 feet high, and some were only a couple inches taller then when planted. Almost all have survived the drought, the nibbling sheep, and the rough, almost soilless lava rock. Down in the almost black lava of the heavy rainfall belt, two-year old ash trees stand 6 to 18 feet high. The ash tree, due to few leaves, is not a very efficient fog catcher (or so we think so far). Lanai indicates that the conifers are better adapted for moisture intercept; a conifer has many needles and on each needle we

minds and attitudes of man. This is the reason why in discussing the Forest Co-operatives in Sweden I have found it expedient to dwell on environment as a necessary background for judging the possibilities and limitations of Forest Co-operatives in Sweden.

often see a drop of water slide to the end of the needle and drop off.

We have planted a few pine trees in the black lava at the upper edge of the heavy rainfall belt, 3200-3900 elevation. These two-year old loblolly pine trees (*Pinus taeda*) 3 to 6 feet high, are jeweled with fat water drops after rains and heavy fogs.

Four month old conifer plantings, at 3500 to 5500 feet elevation, show promise. Inspection in November, 1960 shows good growth of Canary Island pine (*Pinus canariensis*) where the rainfall and fog is above average, and where we had planted our paper potted seedlings in their containers of soil directly to the rough lava field. Where the rainfall is low though fog is frequent, and the lava very rough, many of our pine trees died, even those which were transplanted with their roots in little pots of soil. Again even where rainfall is low and fogs frequent, the Canary Island pines survived fairly well where there was some soil in the lava rock. Pine trees planted as bare roots usually died when planted in the higher, drier, and less broken down rock.

In Kona, from 4,000 to 8,000 feet elevation, rainfall is normally less than 30 inches per year and is very erratic in distribution. In this area, during the summer months and sometimes in the winter, fog shrouds the land from about 11 A.M. till long after the sun sets. Here, thousands of acres of lava flows are still rough and black, or meagerly covered with a stunted growth of native trees and shrubs.

From the above facts, our plans are as follows. At three different elevations, we will fence plots of 2½ acres each. Where there are some stunted trees, we will bulldoze; otherwise we will level the aa rock on one-half of each plot leaving the other half as nature has left it for us. On these 2½ acre plots we will plant many kinds of grasses, legumes, shrubs, and trees. Working with the State Division of Forestry, we will have ready for planting this coming summer, a dozen or more species of pine

seedlings, most of which will be about 6 inches high. Each little seedling will be enclosed in a container of soil, 4 by 4 by 6 inches. After one of Kona's intermittent rains, or better, during one, we will push aside some of the aa rock, drop the pine tree and its container into the hole, then we will push back the aa. As the tree grows, we hope, its needles will multiply and begin to catch some fog drip. The fat water drops will fall to the lava, filter down to the tree's roots. As the tree continues to grow it will catch more fog. And there may come a time when the fog caught and dropped will be in excess of the pine tree's needs.

Someday our Kona black lava fields may be green with self-irrigating pines. And like Lanai there may be an excess of water over the plant's needs and this excess water will sift down through the many layered lava flows to the basal water lens; this water can be pumped out by those who need it along the arid shoreline of Kona.

The concept is correct. Will it work? It has on Lanai.

If we successfully grow pine trees in Kona's black lava fields, the scientists of Lanai's fog drip experiment should be given the credit for our success on the island of Hawaii.

Moose In The Lurch

(From page 21)

with pulp sticks, and her long legs tangled in the sticks? Quickly the men solved this double problem.

They would have to smash the ice and make a channel to the shore, while at the same time clearing away the floating sticks that would interfere with her swimming. The plan appeared possible as the ice was strong enough to support their weight.

First, they managed to work two pulp sticks under her, helping to sustain the huge chilled body. However, the animal struggled against them, only to force herself beneath the water. Yet, when she brought her head to the surface again, she evidently realized their good intentions, and remained passive.

Fortunately there were pulpwood sticks piled along the bank. After putting the two supporting ones beneath the animal, each man took a stout stick and began breaking a channel and clearing sticks obstructing the moose's legs.

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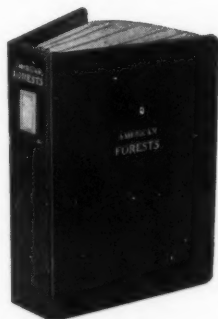


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on slippery uncertain footing, their arms rose and fell, rose and fell, battering away at the ice and clearing the sticks. The wonder of it all! The intelligence of the great beast, as clearly shown in the close-up (Photo 2) with Officer Skeates breaking up the ice.

Though the Sturgeon River is narrow at this point, every blow on the ice had to be carefully placed to avoid hitting the poor beast on the nose, so eager was she to follow bravely each advancing inch of progress till at last she cleared the water and stood upright in the shallows.

Not For A Gooseberry Pie

(From page 22)

ington and Idaho and the wonderful stands of sugar pine in California and Oregon.

Since shortly after the discovery of blister rust in the western states there has been a constant search to find a way to protect the white pines without backbreaking, slow drudgery and the heavy cost of grubbing the ribs. It was known that progress was being made in the field but forest scientists who were doing the research were cautious. They said little about their work. Now the story is a matter of record. We know that easier, faster and more successful methods of controlling the disease have been proved.

The new methods are described in the popular phrase of the day as important scientific "break throughs." The first of the methods involves the use of antibiotics to control or kill blister rust in the individual trees. The second is the breeding of blister rust resistant planting stock by the tree scientists.

An antibiotic is a chemical substance having the capacity, when properly used, to stop the growth of or to destroy bacteria and other microorganisms. One of these antibiotics, known as Actidione, has been successfully tested on millions of western white pines infected with blister rust in northern Idaho during the past several years.

Several million trees were treated with the solution in 1959. So far these experiments have killed blister rust cankers on all test trees. Another antibiotic, Phytoactin, shows promise and is being tested. Both fungicides are applied in the same manner. A minute amount of the antibiotic is mixed in stove (fuel) oil and sprayed on the base of the tree. The material is absorbed and

The river has no steep bank here.

The chilling effects of the bitter cold may be seen in Photo 3. The moose stands almost paralyzed, gazing back in wonderment upon the scene where she had just escaped a watery death. The stout pulp sticks placed under her by the men's ingenuity, and those used in ice-breaking proclaim how heavy and strenuous their labor was.

After several shivery moments she got off to a slow, very stiff-legged walk (Photo 4) toward the burned area feeding ground—trying to reach it before had nearly cost her life.

carried throughout the cambium layer killing the blister rust cankers regardless of where they occur on the tree. The cost of treatment is but a small fraction of a cent per tree. So far no bad side effects to the treatments have been found.

The U. S. Forest Service has large scale operational tests under way in the Northwest using Actidione on western white pine and sugar pine. Tests using Phytoactin are being made on sugar pine by both the Forest Service and the Bureau of Land Management. Experiments will continue to determine sound procedures such as dosage levels, the best carriers, time of application, and to learn if the chemicals are successful in killing blister rust in all white pine regions.

The second answer to control of the disease may eventually be simpler than spraying the base of each tree with chemical. Special western white pine and sugar pine seedlings are being developed which promise to be immune, or at least strongly resistant, to blister rust.

How is such a tree strain developed?

It was observed many years ago that an occasional western white pine or sugar pine was thrifty and unaffected by blister rust when its fellows on all sides were being slowly choked to death by blister rust cankers. These thrifty trees were not an accident. For some reason they were blister rust resistant. Other such trees were found and with these few trees a careful process of control breeding was started to create blister rust resistant strains.

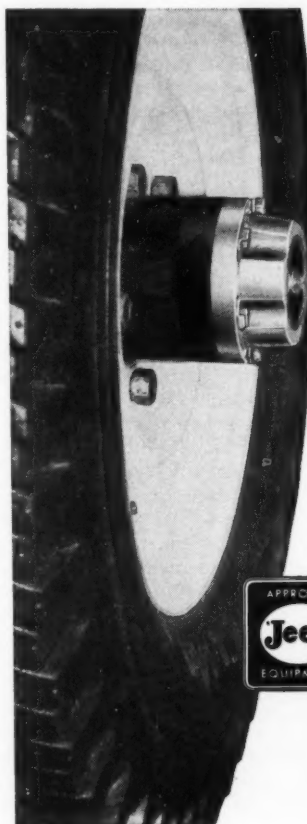
The job of finding rust resistant trees and covering the cones with dust-tight transparent bags after which they are dosed with pollen

from other blister rust resistant white pines is continuing. The seeds from these cones are planted in special nurseries. When the seedlings are one to two years old they are artificially inoculated with blister rust fungus. After the blister rust spores have germinated most of the one and two year old trees show lesions from an attack of the disease, but these lesions are as much as ten times less than an average white pine seedling would have under similar circumstances.

There has now been sufficient experimentation to prove that this form of resistance is due to the blister rust resistance of the parent trees from which the seeds were selected. A second type of resistance is found in the seedlings which show spots of blister rust on the needles but will not permit its spread to the bark of the tree. In still other small trees with strong resistance the disease reaches the bark but the infection is isolated by the resistance of the seedlings resulting in their survival. Thus the progeny of the blister rust resistant trees indicates the strength of their resistance. The strongest of the mature trees are being selected for a seed orchard. More of these trees are found each year and are being tested. It is believed that at some time within the foreseeable future a sufficient number of these seedlings will be available for reforestation in all white pine areas.

This development and the spraying of antibiotics on trees infected by blister rust could have saved the government and private landowners millions of dollars if they had been discovered decades ago. But the millions that were spent in keeping the "Gooseberry Army" in the field were not wasted. They protected some large areas of young western white pine and sugar pine from destruction by blister rust. The projects provided work for thousands of men and boys who otherwise would have been unemployed. In addition the well organized and well supervised crews who climbed mountains and dug gooseberries and wild currants day after day developed, with training and experience, into some fine forest fire suppression crews.

Like many forestry projects and techniques, blister rust control has always been difficult for most of the public to understand and accept as important to forest protection. One elderly lady, after watching a blister rust crew working through a woodland and after being told what they



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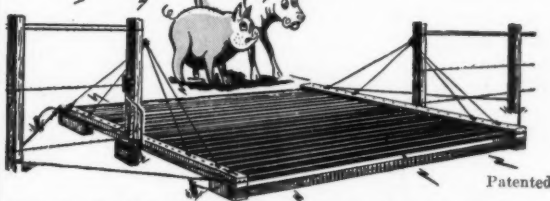
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were doing, wrote to the superintendent of the camp:

"While your men are destroying all those nice gooseberry bushes why couldn't they pick the gooseberries and bring them to me. I will can them or give them to other people for pies. I notice, too, that the men stretch strings all over the forest and leave them. If they will go back and roll up that string and bring it to me I can use it in my crocheting."

The blister rust camps were usually pleasant, happy places and often their location was picturesque, beautiful, or both. The horse shoe pitching after a hard day on the mountainside was expert and hotly contested. The card games were noisy, good natured and never ending. They began each night where they had left off the night before. The food was nearly always good. Usually there was some fishing nearby and a swimming hole.

The bear, rattlesnake and yellow jacket stories were as varied as the circumstances and the story tellers. One of the best bear stories from a "blister buster camp" was told by Bob Warnock who for many years has been superintendent of the Bureau of Land Management blister rust projects in southern Oregon. Bob is a seasoned mountaineer with a sweet sense of humor and a talent for story telling. One story went as follows:

"A big, brown bear had raided our camp several nights. He had broken into the meat cooler and the mess hall so many times that the cook was thoroughly aroused. Two of the foremen had brought revolvers to camp and promised the cook they would teach the bear a lesson the next time he came back. A few nights later he did return and announced himself by slapping over the garbage cans. It was a terrible noise followed by a louder uproar made by the two foremen who were shooting their revolvers and yelling. Then there was

a half hour of silence and the camp was getting back to sleep when the garbage cans started banging again followed by volley after volley of shots as the foremen tried to chase the bear in the wan light of a new moon.

"I felt that I had had enough of the noise of battle. I slipped into my clothes, rolled up my sleeping bag and took the trail to the ridge above camp. In a flat, smooth place on the trail I rolled out my sleeping bag, took off my boots, folded my clothes on them, stretched out comfortably in the bag and vaguely heard more shooting in the camp as I went to sleep. I don't know how long I had been asleep, but I know what awakened me — something was breathing down into my face and he had a vile smelling breath. I lay perfectly still for a few seconds and listened to the breathing, then I opened my eyes. In the pale light the biggest, ugliest face I had ever seen was looking down into mine.

"I didn't know that I was scared until I screamed and I didn't know that I had screamed for I didn't know I could scream like that. When I jumped up so did the bear. For a few moments he stood in front of me on his hind legs. He looked twelve feet tall. I had read grizzly stories of men being hugged, so I screamed again. With that I tried to run with my sleeping bag pulled up around me. I fell into the brush and the bear fell over backwards. The last I saw of him he was crashing through the brush as he raced out the ridge.

"I got out of the sleeping bag, put my clothes on and sneaked back into camp as quiet as a mouse."

In the future blister rust resistant white pines probably will make gooseberry camps unnecessary but some of the good stories that originated in the old camps of the "Blister Busters" should live on and become part of our woods folklore.

Parks, Seashores, and Canals

(From page 25)

At the same time, the Chief Forester said the AFA wished to point out that H.R. 9050 of the preceding Congress included a sizable portion of the residential area of Cape Cod within the proposed boundaries of the national seashore. Mr. Pomeroy said, "We think these residential areas should be excluded to the extent it is practical to do so." This proposal to exclude people living in towns wherever possible received the endorsement of a number of Massa-

chusetts members of AFA, including Board Member James J. Storrow, of Boston.

However, none of these details attendant in the creation of a new park or monument are considered insurmountable, and AFA stressed that the main idea is to establish the Great Beach area as a national seashore before development whittles it down and destroys its beauty.

With Washington's famous C. & O.

Canal now a monument, activity was also picking up in the nation's capital last month to give Dinosaur National Monument national park status. The monument already has full park protection, according to conservationists, as the result of efforts by Senator Allott and Rep. Aspinall to have the monument's boundaries set by Congress. Here again, as in the case of the C. & O., some groups have contended that water and water development should be given prime consideration, and some Rocky Mountain area people even contended conservationists failed to live up to their commitments in reference to water priority. On the other side of the coin, conservationists are downright unhappy over what they regard as failure of Congress to establish necessary safeguards to protect the famous Rainbow Bridge, long regarded as one of the West's great landmarks.

Here's To Better Hunting

(From page 49)

numbering as high as 650 and as low as 300. "Weaners" are purchased every year, and every year fattened steers aged not less than two years are sold on the open market, as they would from any cattle ranch in the west. Proceeds of the cattle sale help defray the cost of running the refuge.

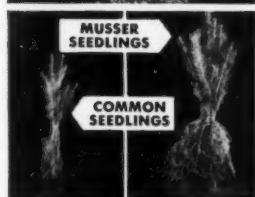
The secret of successful ranching, Dr. Cottam says, is not to overgraze the carrying capacity of the land. The good earth will produce just so much, be it corn, wheat, vegetables, trees, cattle, or wildlife. When land is abused, its productivity diminishes, and you produce less corn, wheat, vegetables, trees, cattle and wildlife. When the land is kept at a high productivity level, cattle and wildlife, particularly deer, do not compete. The plants grazed by the cattle are not the same plants browsed by the deer.

However, when the land is abused—and overgrazing is the most common form of abuse—then deer and other wildlife compete with cattle for existence. Such competition can be reduced to the starvation level if the land is allowed to get in bad condition.

At present there are some 140 different types of grasses on Welder, almost all of which are good cattle feed. Deer browse mostly on shrubs, herbs, and aquatic plants, with some grasses thrown in for good measure.

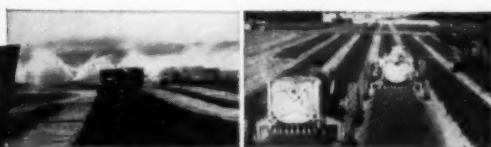
In short, Dr. Cottam says, if a cattle ranch is run properly, it will produce an optimum number of healthy

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livestock while at the same time produce a high wildlife population. There will be little competition for existence between the two. It is when land is overgrazed and erosion sets in that the trouble starts. Then wildlife and livestock compete with each other with a vengeance. The poorer a ranch becomes in productivity of its land, the less cattle it will support, and by the same token, the less wildlife will exist upon it. A good ranch will produce a greater number of healthy cattle and a greater wildlife population; while a poor ranch will produce less healthy cattle and fewer of them along with a reduced wildlife population.

At Welder Dr. Cottam practices a rigid program of "controlled grazing." The ranch is divided into a grid pattern and cattle are allowed on certain sections for certain lengths of time. In some sections no grazing is allowed for as long as six months. These areas show an amazing growth, the grasses growing waist high and dense enough to hide a good sized deer at 30 feet.

During my week's stay at Welder we cruised the area in a specially built light sedan striking out across the prairie and grasslands at will. We seldom saw a road, except when we left and returned to headquarters. As Dr. Cottam put it, "if you drive over it twice, it's a road; more than that, it's a boulevard."

We saw deer, wild turkey, quail, doves and cattle wherever we went. They popped out of the grass and shrubbery like rabbits in a lettuce patch. Hawks of a dozen different species soared overhead, while the trees and shrubs disgorged song birds of every description. All this, mind you on a commercial cattle ranch deep in the heart of. The only definite measure for wildlife welfare during the past four years has been stern control of overgrazing and equally stern measures to check and prevent erosion. During these four years the cattle have waxed fat and sassy.

The "grid" system instigated by Dr. Cottam has set up a permanent record of all experiments on soil, fauna and flora, that have been and will be performed by students and technicians anywhere throughout the area. Thus in years to come records will be available of practically every foot of the refuge pertaining to any changes in vegetation due to livestock and wildlife use.

Part of the regime of the Welder Foundation calls for giving outstanding college students the opportunity

to pursue their masters and doctors degrees in various forms of wildlife management, zoology, biology and botany. The foundation gives scholarships to such students who are selected by the universities with the approval of Dr. Cottam. These students live on the refuge, with their wives and families, if any, for periods up to a year or more. They have full use of all laboratory equipment, and, of course, unlimited opportunity for field study. So far, 14 college graduates have completed their masters' or doctorate degrees at the Welder Foundation.

Another important work of the foundation is cooperation with state game commissions and the various state wildlife federations as well as sportsmen's groups and various interested individuals throughout North America, and in some cases, even Europe.

Dr. Cottam is deluged with invitations to speak at gatherings and conventions from New England to Oregon and also gets thousands of letters from groups and individuals asking permission to visit the area. The director fills such engagements as he feels are most important, and permits visits of groups and individuals whom he believes will do the most good for conservation and wildlife.

All is not serene and placid at the Welder refuge, for Nature can be brutal at times. During the rutting season, the male deer stage fights that would make the latest Johanssen-Patterson scrap a ballroom waltzing contest by comparison. The bucks have at it with no holds barred and devil take the hindmost.

Turkey gobblers also are mean scrappers during the love making season. The males fight sometimes until they are completely exhausted and not infrequently blood is drawn in these ferocious contests. It doesn't do for a tom turkey to be a loser in such a fight, for once he is licked, the rest of the toms in the flock will turn on the defeated bird and peck the tar out of him and actually drive him from the community. He leads a lonely life from then on unless he can whip the stuffing out of another tom in another flock and get himself reinstated on the social ladder.

Getting back to the cattle-wildlife relationship, Dr. Cottam has a few words for ranchers all over the United States, and the world, for that matter. The advice is simple and sound, not cluttered up with biological terms.

Naturally all cattle ranches are

not the same. Southern Texas is blessed with a relatively warm year round climate, good soil and a fair rainfall (30 inches per year average) which makes for a larger number of cattle (and wildlife) per acre than many areas of the more arid west and north. Also the type of game birds and animals differ with geological changes. In the arid West, antelope and even bighorn sheep supplement deer, and blue quail take the place of the bobwhite. Elk are supported on ranches in the northwest. However, no matter what the range is able to carry, always put less steers upon it than it will normally support. Thus if a 10,000-acre range can ordinarily sustain 1,000 head of cattle, do not put the full 1,000 upon it. Rather let it support 800 or 900 steers.

If the land has less cattle upon it than it will normally support, then when and if a drought comes (as it does often enough, as any rancher will tell you) the ranch has a much better chance of coming through undamaged than a ranch which is carrying a full load.

During times of drought, both cattle and wildlife suffer, as there is not enough feed and water to go around. During normal times, neither suffer, as there is ample feed and water for both. It is only during

drought times that wildlife and cattle suffer, for it is then that they compete with each other for their very existence.

In extreme cases of drought, the rancher suffers severe monetary loss or even goes broke. Wildlife on his land suffers in a more deadly manner—it dies off or becomes almost non-existent.

The less than normal amount of cattle idea is purely for protection—call it insurance, if you will. The wildlife upon the land take nothing from the cattle, and in a sense one can eat his cake and have it too.

Too often, Dr. Cottam says, avarice is the downfall of the rancher. He sees 50 or so acres of prime grass, and it hurts him until he can put a few steers on it. Comes a drought and the whole ranch is in peril. For the sake of a few dollars the unwise rancher puts his whole spread in jeopardy, and threatens his wildlife with near extinction to boot.

Always remember a ranch in good condition will support prime steers, but a ranch in poor condition won't support much of anything.

Good wildlife populations and good ranching go hand in hand, and as a popular ditty has it, "you can't have one without the other."

The Back Trail

(From page 27)

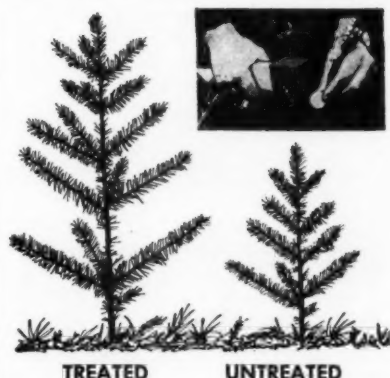
I was in familiar territory. All morning we traveled across the Flathead valley around the east side of Flathead Lake, and on to West Glacier (before Glacier Park was created it was called Belton). What is now the park was formerly a part of the Blackfeet National Forest. I became supervisor of that forest in the fall of 1910, but about a year previous to my coming, Glacier Park was created. So, I was almost a supervisor of what is now Glacier National Park. Belton, at that time, was headquarters for all the North Fork of Flathead territory. A rough wagon road ran from Belton, skirted the south end of Lake McDonald, and went on north to Big Prairie, near the Canadian line. Here, a dozen or more settlers lived, raising hay on their meadows to feed cattle through the winter and grazing them on the national forest in summer. I was, therefore, familiar with the west side of Glacier Park but I had never seen the rest of it.

We ate lunch at a rustic park lodge at the upper end of Lake Mc-

Donald, then began the climb across the continental divide over the "Going to the Sun Trail." Most roads across the mountains, with which I am familiar, pick out the natural route up tributary streams, taking what seems a logical way to the top. Not so with this road. Evidently the engineers laid it out so as to produce a result in keeping with its picturesque name. This was indeed spectacular—a motor road apparently defying the mountain topography, going steadily and relentlessly up and up on a steady grade, firmly but surely overcoming all obstacles, to finally reach the pass on the top of the American continent. It was a wide, safe road, but much of it from Lake McDonald to the top, was like a shelf carved out of the resisting mountain slope. Along the route, the upper slopes and the ridges are largely bare of vegetation. The crests of the ridges are seldom smooth for long; they are crowned with a whole series of sharp jagged fearsome looking peaks.

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tains seemed to have drawn back, leaving a flat space where shrubs, flowers and bear grass were in full possession of the ground. All of the long string of cars, as if with one accord, took advantage of the ample parking space to stop and allow the tourists to relax and view the scenery. It was good to look at too—better from the safe anchorage afforded by the flattened terrain at the pass than it was from a moving car. Somehow, it gave me an uncertain feeling to look at those jagged peaks and sheer cliffs and “glaciers” hanging to their sides from the seat of a moving car, which itself seemed to cling uncertainly to the mountain side. It seemed a bit like maybe we were going to the sun. What a relief to find one place where the earth was flat!

The guides said that those patches of snow we were looking at were the glaciers. They did not look to be very large but they added to our wonderment. At the pass we got our first glimpse of the mountain goats for which Glacier Park is famous. Far away on the distant rocky and inhospitable slopes, by means of binoculars, we could pick out white spots which moved and which the guides assured us were goats. I recalled the story told me by Frank Liebig years ago. Frank had been a ranger on this part of the park before it had become Glacier Park. He told me about climbing the mountain in winter's deep snows where the goats wintered. They maintained passageways (open cuts) in

the snow from one feeding ground to another. It was easy, he said, to lay in wait for the goats, and either shoot them, or pounce on them as a cowboy does in bull dogging a steer. In the latter case, they could be easily overpowered, roped and taken alive.

We never got a closer look at the goats, and not much closer to any of the glaciers. Some, no doubt, were larger than “patches of snow,” but, as glaciers, we were not much impressed.

We drove on down the east side of the divide and stayed at Many Glacier Hotel, on Swift Current River. This is an immense structure made largely of fir and larch logs, with the bark retained—not all one building but a series, hooked together with connecting “breezeways.” There were tremendous crowds of tourists. This was the end of the motor road. From here on, the scenery could be viewed from the balconies of the hotel, from boats, from the saddle horses, or walking, which was very good and considerably cheaper. The horses were gentle, no doubt about that. We watched the mounted tourists start from the hotel in the morning; we met them on the trail. We decided to walk.

We took one trip to see Iceberg Lake—ice floating in the water—and had a wonderful look at the mountain goats. The distance was six or seven miles from the end of motor travel. I thought that I was still a tough guy. Last spring, I had cruised a 300-acre tract of timberland in West Virginia. Those who know West Virginia will agree that was a good test. So I voted for walking; I scorned to ride those “tired old horses.”

So one fine day, John, the two boys and I, started about 9 A.M. The trail was good, an easy even grade all the way. It was cut through an old burn grown up with wild cherry, snowberry, huckleberry, mountain ash, bear grass, thimble berries, phlox, asters, and occasionally lodgepole pine, balsam, and spruce. Most of the cover was low. We could get a good view (close-up) of some of the cliffs and “glaciers.” We could see mountain goats too (same view as from “Going to the Sun Trail”). When we reached 11½ miles from the lake we turned back, as it hardly seemed worthwhile to go further just to see “ice floating in the water.” The boys wanted to take a dip under a waterfall, so they said, “Grandfather, you go on ahead, we'll catch you before you get very far.” So I

started but I had a notion that maybe they wouldn't overtake me after all.

I walked at a good clip. For the first three miles I felt fine, the grade was just gently downhill, and it was easy walking. No, those young rascals were not going to catch me. Hadn't I been training myself to walk since I was younger than those boys? But something went wrong. I was slowing down—not out of gas because it took almost no energy to keep moving down this trail. I did not feel tired, but I had to keep pulling myself together—upright. I was leaning to one side, or did I just imagine it?

John and the boys caught up with me. The boys said, "Grandfather, you are listing to starboard." I knew they were right, but why, I could not tell. They said we had a half mile to reach the car. The boys walked on ahead and John stayed with me. He seemed a bit worried, and in fact I was a little disturbed myself. I was "listing to starboard" all right. Several times I almost fell even when going very slowly. But finally we reached the hotel. I managed to reach the dining room for lunch. Then I rested all afternoon and went to bed early. Next morning, all was well, but I did not walk for the next two days.

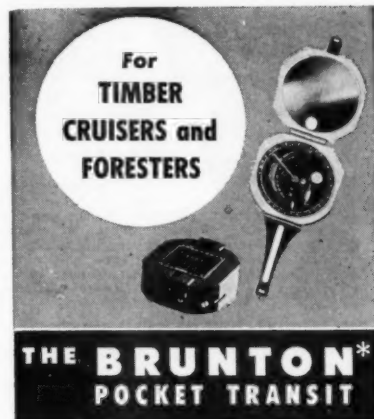
Next day we drove north into Canada, through beautiful lodgepole country. We went across the continental divide at a low pass, and returned to the USA via northern Idaho above Bonners Ferry. The end of the second day brought us to Paradise Inn, near timberline in Mt. Rainier National Park.

Now I was very close to the spot where I had camped in 1907, on top of the Cascade Mountains. I was working at the business of forestry then. Now I am a retired forester,

a tourist staying at a fancy rustic inn in a national park. Then, I reached the top of the Cascade range on the back of a horse and my bed was on balsam boughs under the stars in one of the beautiful mountain meadows found throughout these Cascade Mountains.

I was forcefully reminded of that night so long ago—outside the park, but at an elevation only slightly lower than here at Paradise Inn. This night in the hotel, the air was cold, and there was no heat in the hotel room, or at least it was not adequate. I was cold in bed for half the night in spite of abundant blankets. How different was that balsam bed in the meadow! The air was cold that night on the meadow, too, and our blankets were very light. My companion was an experienced mountain man. I was an inexperienced "would be woodsman." I looked at our thin bed roll. "Joe," I said, "will we likely sleep cold tonight?" "Oh, no," he replied with an air of confidence that, unfortunately, I did not share. "You wait, you'll see."

I cut the boughs for the bed while Joe got the supper. "Where shall I arrange these feathers for our bed?" I inquired. "Just put them in a pile there; we'll arrange them later." After supper, Joe added more wood to our fire. It felt good and was cheerful, but it spread out more than seemed necessary. We smoked our pipes and talked. The fog was coming in fast. We could hear the tinkle of the bells, telling us the whereabouts of our horses. I feared a cold night, bed time in the Cascades. We threw aside the large unburned logs and quenched the blaze with water. We brushed aside the hot coals with pieces of my balsam boughs; then we laid our "feathers," shingle like where the camp fire had been; put



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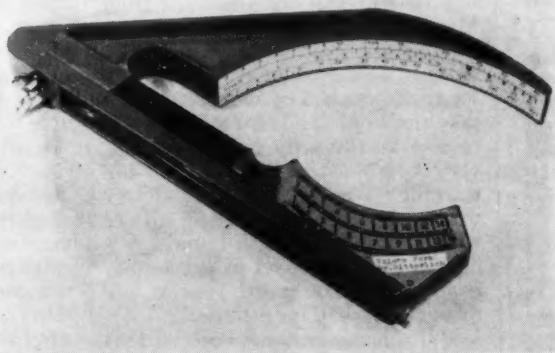
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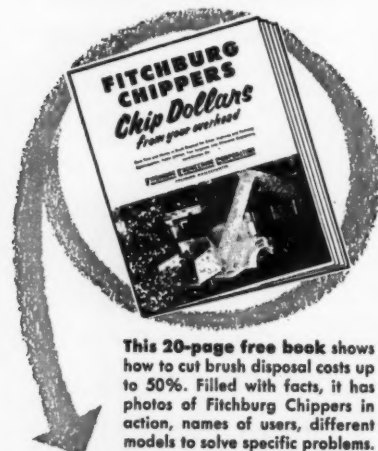
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our bed roll on top. The heat from the warm earth beneath us oozed up and kept us warm all night.

However, Paradise Inn had attractions I have not yet mentioned. It was located on the upper edge of timberline, in the clustered groups of sharp pointed balsam and spruce, pine, or hemlock, just before "timberline" gives way to "above timberline." The space between the clustered groups of conifers, where we are accustomed to find mountain meadows was partly only bare rock, sometimes solid, sometimes broken, but without vegetative cover. But most of the "between tree space" is occupied by wonderfully beautiful beds of wild flowers, for which Mt. Rainier is famous. This was the middle of August, yet the fulgence of color was something even June could be proud to claim—blue lupine, red Indian paint brush, a variety of colors in asters and phlox, and many yellow blooms that I could not name. The edges of the numerous flower beds were marked by club mosses, gently curved to fit the contours of the terrain. These were not made by national park gardeners, but only by the sun, wind, and rain, and perhaps by the snow, fogs and glaciers too.

We saw quite a variety of animals, a black bear with cubs, a brown bear, and several deer, but no moose or elk. From the Inn, trails (these were man made, some paved) ran at all angles up the mountain to the glaciers and ice caves, which were the chief reasons for their existence. Many tourists walked. It was less than three miles to the lower end of the nearest glaciers, but many more miles to their beginnings at the top of the big mountain, 14,400 feet elevation.

There was no doubt about these natural wonders; these were real glaciers. Overnight trips to the top could be taken with guides where the campers could sleep warm from the hot air that still oozes upward from Mt. Rainier's "innards" (here I'm quoting the guides). We were content, as were most of the tourists, to see the lower end of the glaciers and take the upper ends on faith. I was careful at this stop not to attempt very long walks—I had heard the warning. I remembered too that I did not have to go to the top to get warm air for my bed. Long ago I had learned the secret of extracting, from the mountain, warm air through my balsam mattress.

Many, many guests at both national parks we had visited seemed to be

having a good time. Hotel employees were mostly college girls and boys, and they, too, were having a good time. Judged by the standards of Glacier Park, Paradise Inn was very small. At each end of a large lobby was an enormous fireplace, where blazing logs drove back the chill and gave much cheer and comfort. The college "help" gave a little entertainment each evening—songs, dances, and comedy sketches.

Down the road next day to Portland, gave us a good look at the succession of forest growth through which the road led. Our sub-alpine type where the Inn was located, soon gave way to solid stands of lodgepole and spruce, then white fir and cedar, and, at the lower level, the typical heavy commercial stands of Douglas-fir, cedar, white fir, pine—the big trees four to six feet in diameter and 200 feet tall. There is not too much of that kind of timber left in this part of Washington.

In 1907, when I was working in western Washington, I traveled through a great deal of the heavy commercial Douglas-fir forests. Donkey engines, logging railroads, high leads, then were bringing in the tree harvests, but without much prospect that there would be any "tomorrow" for this forest. Forest fires ran rampant through the logged woods, a very discouraging prospect. There were few foresters in the woods in those days except those employed by the state or federal government. The loggers and the lumbermen were willing to grow new timber crops, but they could not see any practicable way to do it. The foresters had no ready solution either, but a combination of factors, men and machines, did solve the problem.

And what a change has taken place! Logging railroads have been succeeded by truck roads, railroad cars by trucks, high leads by crawler tractors, cross-cut saws and springboards by chain saws, itinerant lumber jacks by logging towns, and, to some extent, spar trees by movable steel spars. Not always a complete revolution, however. There are still places where high leads must be used, but destruction no longer necessarily follows the logging. Almost everywhere now there is a tomorrow for the forest. Young growth is being cared for through much more successful fire protection, and new forests are being planted, making continuous timber production a reality. Even in the redwoods and in the pine woods of California there has been a similar birth of forestry.

It's true also in the South, the Southwest, the Lake States, the North Woods—everywhere now the woods are full of foresters. The Keep Green and the Tree Farm movements as well as improved values for timber products all have helped.

The period 1907 to 1960 is quite a span of years—the days of Pinchot, Graves, Greeley, Silcox, Butler, Austin Carey, and many others, including a whole lot of broadminded timber owners, have brought about almost a complete about face in the forestry outlook for America. As I drove with my family through western Washington and these thoughts filled my mind, I was glad that I had even a small part in so great a development of American forestry.

At Portland my family left me and went on south to California in the car, and I worked my way east on the Union Pacific Railway. While in Portland (my first farewell visit) I tried to visit with as many friends as I could locate from the old days in forestry in the West. Portland seems to have acted as a sort of settling basin for old time foresters. On the phone I visited with Stuart Moir, and Lyle Watts, neither of whom were in shape to entertain visitors. I called on my old friend Albert Arnst, now editor of *The Timberman*, and reviewed with him the developments in the western logging woods.

Forty years had passed since I had last seen my old friend Charley Farmer from Missoula forestry days, now a consulting engineer in Portland. I spent a delightful evening with him and his wife at their home. Now, I must mention one more visit that did me a lot of good, an evening with Don Bruce and Dave Mason and his wife at the latter's home in Portland. In business hours, it is the firm of Mason and Bruce, consulting foresters for many years in Portland. Way back, you know, Dave was part of the staff of the district (now regional) office of the Forest Service in Missoula when first it was organized under the leadership of W. B. Greeley and F. A. Silcox in 1908. I was there too. Dave was, a little later, supervisor of the Deerlodge, and Don became supervisor of the Flathead.

We could hardly be too serious on an occasion such as this. We laughed at the story one of us recalled about the six foresters who tried to sleep in one small cabin in the woods up the Bitterroot valley. One lone pack rat started running along one of the horizontal logs which supported the

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roof — rattlety-bang-bang — you remember how much noise one pack rat can make in the still of the night? It was very dark in the cabin, but the sounds were very clear. One of our number (let's not identify him) took aim at the sound with a six shooter. He was lucky, or was he? He hit the rat, which was just above him. Blood spurted in his face, and the dead rat fell at his feet with a dull thud. After a time, silence was restored and slumber once more ruled the darkness. If "the night drove on with sangs and clatter" or with rattlety-bang-bangs, after that incident, we were not again disturbed. We slept. How good are such memories and how delightful it is to recount the old tales about the days long past!

Now one more tale about a wonderful fellow who belongs to those old Missoula days, but who has passed on to new adventures in the land beyond the beyond! Jim Girard, in the last five years of his life,

was a member of the firm of Mason, Bruce, and Girard. I was glad to learn that through Mason and Bruce and other friends of Jim, a suitable memorial had been established in the national forest near Seeley Lake Montana, where Jim got his start in the Forest Service. Jim Girard was one of the most remarkable foresters ever to appear on the American forestry scene. He was my good friend of Missoula days, as well as ever after.

A plaque, securely affixed to a huge boulder, reads as follows:

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Here at Seeley Lake, in 1908, he began his work for the United States Forest Service.

Reading About Resources

(From page 40)

its resources and facilities generated by the failure to solve these problems on the part of the large, nearby metropolis. These satellite communities are being forced to accept the dormitory resident who enjoys an urban environment and who has become disillusioned with "suburbia" and "metropolis" alike. Most often these satellite cities have been able to conserve the charm and beauty of urban design generated by the architectural and planning skills of past centuries. To the disadvantage of most of these smaller urban communities, conservation of their characteristic architecture, streetscapes and urban open space has been a result of an economic and cultural decline brought about by an earlier shift in population and economic life to the nearby metropolitan center. In a sense, these smaller communities are fast-disappearing oases in the monotonous desert of urban decay, industrialization and suburban sprawl which makes up so much of the landscape of America today.

The second problem which Dr. Higbee has only lightly touched on in an otherwise fascinating exposition is the matter of the conservation of our three dimensional cultural heritage. Certainly the buildings, parks, and environments which formed the human background for

our national growth in the early years of this nation are as worthy of conservation and preservation as are the open land areas, water ways, plant and mineral resources on which we hope to build our life in the future. Americans have been termed members of a materialistic society, but I hope that we are not so materialistic that we will ignore these aesthetic values as we provide for our bodily needs. Conservation of physical resources is a pressing problem, but emotional and cultural resources should receive greater emphasis from the professional planner, if they too are to survive.

Perhaps in a later volume Dr. Higbee will treat these two problems. If he does, I am sure that the result will be as informative, perceptive, and readable as *The Squeeze*. (R. J. K. II)

New and to Note

Catch'em and Cook'em, by Bunny Day. (Doubleday & Co., 1961. 114 pp. \$1.95.) This "how-to-do-it" book is the best answer I have seen to the beach-vacationers' agonies. Having spent a good many summers beside the sea, I know these agonies first hand, and they usually boil down to the question of how do you catch and cook fresh seafood? After sun-bathing has palled, and the possibilities of extra sleep have been

exhausted, there's nothing left to do but fish and eat. But as every fellow-vacationer knows, there aren't any fish, at least not enough of the right kind to make it a very attractive pastime.

At this point we turn to clamming, and Mrs. Day's book. She tells us how to identify the various shellfish, how to locate their beds and what methods to use for the harvest. Most important, perhaps, are her explicit directions for cooking them, in any and every good way imaginable. Better to spend \$1.95 on this book, than eat in ten good restaurants.

Manual for Park and Recreation Boards and Commissions, by Edward A. Connell. (Bulletin No. 1 of American Institute of Park Executives, Oglebay Park, Wheeling, W. Va., 1960. \$1.00 to members; \$2.00 to non-members.) This is one book that the title describes in a phrase better than I could do in two paragraphs. One word, however, there is nothing theoretical here, this is all practical stuff.

How to Fertilize Trees and Measure Response, by Stanley P. Gessel, Kenneth J. Turnbull, and F. Todd Tremblay. (National Plant Food Institute, 1700 K Street, N.W., Wash. 6, D. C., 1960. 50¢.) For many years there has been the need for a clear, simple handbook of this type, which,

while doing no injustice to technical knowledge, distills that knowledge to a form that makes tree fertilization and growth measurement a practical operation. Its usefulness warrants a wide sale.

Look to the Wilderness, by W. Douglas Burden. (Little, Brown & Co., 1960. \$6.50.) Burden, one of the country's most distinguished naturalists—and one of the most readable—has prepared a globe-girdling account of his adventures, and preceptions in far off wildernesses.

This is an exciting book. It is written with a great sense of "presence" and immediacy. It is probably the most that an arm-chair wanderer could hope for. The illustrations are home-made; but there is so much polish in photography these days, that it's good to see again the kind of snapshots you or I might take.

The Genus Peniophora, in New York State and Adjacent Regions, by Anton R. Slysh. (Technical Publication No. 83, Syracuse College of Forestry, 1960. \$1.10.) This completely scientific fungus study is most definitely for the professional fungus man, and few others. But the subject is one of increasing importance, and there are those specialists who will find this sort of publication invaluable. It belongs to the enviable class of the other Syracuse bulletins.

Deer, Trees, and People

(From page 14)

ance between deer populations and the carrying capacity of the forest deer range.

So much for a hurried background sketch as to where we have been. The real problem, of course, is the present and future. I would like to approach this discussion in three phases: 1) The technical aspects of the problem as viewed by the forester; 2) Do the forester and game manager see the same problem? and 3) The public - the real problem area.

The Technical Aspects of the Problem as Viewed by the Industrial Forester

It must be recognized that the problem of the industrial forester and that of the public-employed foresters is decidedly different. An industrial forester must recognize the profit motive in running his program. Therefore anything which increases or prolongs the accumulation of expenses to management costs is

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Just what is deer browse damage and when does it become of concern to the forester? Browsing, of course, consists of eating by the deer of leaves, twigs, and the small, tender, and succulent seedlings and advanced size reproduction up to eight feet tall. Deer, as well as people, show considerable food preference in their eating habits. Ironically, what the deer prefers in his diet is the same kind of trees that the forester would like to develop as his future timber crop. Browsing therefore becomes of concern to the forester when it occurs to the degree



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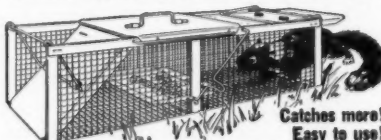
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Bears in My Kitchen—Merrill 3.95
Conservation—Coyle 5.00
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Conservation of Natural Resources—Smith 8.50
Conserving Natural Resources, 2nd ed.—Allen 6.75
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Forest Fire—Davis 12.00
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Lookout For The Forest—Blough 2.75
Traveling Birds—Boulton 2.95

THE AMERICAN FORESTRY ASSOCIATION, 919 - 17th Street N.W., Washington 6, D. C.

that natural regeneration of preferred species cannot be secured or maintained within five to ten years after cutting and when, in the opinion of the forester, the quality and quantity of reproduction is not sufficient to satisfy the forest owners' required stocking standards.

As a means of furthering and creating a better understanding of this problem, both public agencies and private landowners are beginning to establish deer exclosures as a visual aid in showing what unmolested forest regeneration will look like in comparison to the average woods which show a variety of reproduction subject to regular browsing activities.

These deer exclosures, I believe, are just as effective in opening the eyes of those close to the woods as for the general public. Certainly the young and inexperienced foresters could well profit from these observation areas, for as they are turned loose in the woods without much background or experience they are inclined to look at browsed-damaged hardwoods and assume that such conditions are normal and no problem exists. Furthermore, I believe that top management of wood-using industries could also benefit from such periodic visits to observe the effects of browse damage to their forest properties. Forest properties destroyed by fire, insects, and some diseases are generally spectacular, and the damage is plainly evident for all to see. Losses from such causes are considered deplorable, and such a waste of natural resources soon generates a series of high priority conferences. Damage to the forest from excessive deer browsing is quite the opposite, however, for it is sort of a cancerous-type malady which works slowly and unnoticed, except to experienced eyes, until the final stage is approached. When in the final stages of destruction, whether it be in the human body or in a forest, we are all prone to ask, "Why didn't someone get at this sooner?"

With the development of more refined and exacting systems of forest inventory procedures, it is quite possible that this matter of browse damage to the forest will be receiving a greater amount of attention. It would seem that the currently popular continuous forest inventory would lend itself to a periodic measure of the loss of forest growing stock. The replacement of hardwood forest growing stock is dependent upon natural regeneration, and when such replacements

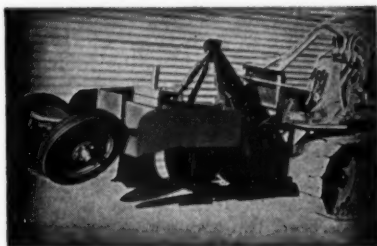
are delayed 10, 15, or even 30 years, there will be questions asked and an accounting for what has happened.

Do the Forester and Game Manager See the Same Problem?

It has been said that the forester and game manager, when considering this problem of deer and forest management, are pretty much on common ground and that there is little difference in their approach to the problem. To this type of thinking I cannot agree. The objectives and products of their management are different, so why shouldn't the approach to fulfilling management obligations be different?

The game manager who, for instance, is concerned with deer, thinks in terms of an abundance of available preferred browse species and adequate shelter on his deer range. Inasmuch as browse consists mainly of leaves and twigs up to one-eighth inch diameter, the general shape of the plant producing the browse is of slight importance. A fair amount of deer browsing on a maple seedling, for instance, can produce a shearing job which will naturally create a good number of leaves and twigs per tree and thereby increase potential browse for a given unit of area. Conversely the forester wants young hardwoods which are straight, have clean stems which rapidly prune themselves, and closely spaced stands. In these instances quality of product is vastly different according to objective of management.

Another facet of this problem which causes a wide-spread difference of opinion is the matter of winter versus summer range of the deer herd. I think that I would be reasonably safe in saying that in Wisconsin, at least, if all deer feeding were confined to the so-called



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winter deer yards—usually the swamp types—then foresters wouldn't be too much concerned with this problem. The swamp types are usually slow growing and at present do not present as serious a problem to forest management as do the more fertile and higher yielding upland types. The game men maintain that the nonwinter range is not important to them or the deer, but here is where the forester's problems are developing. Contrary to the opinion of some game men, the summer browsing on the succulent hardwood sprouts and seedlings is decidedly harmful to the forest and discouraging to the forester who wishes to establish fully stocked stands of the species he wants. I believe that this matter of summer vs. winter range is one of the greatest points of difference as viewed by the forester and game manager.

Experience in one of Consolidated's forestry blocks in northern Wisconsin has given us some insight as to the relative amount of deer damage present in the swamp type compared to the upland hardwood types. As observed by our company foresters and with management objectives in mind, it was discovered that deer damage is 10 times more prevalent in the hardwoods than in the swamp types. To a game manager just the reverse might be true. Here, I believe, the right answer must be determined by the one who owns the land, pays the taxes, and who is controlling the management policies of the land.

I do in no way wish to imply that foresters need to perpetuate a running battle with the game men. Certainly these men have a job to do and have their share of burdens to bear without further tirades to dodge. Our industrial foresters in Wisconsin have on several occasions given all-out support and endorsed the policy and program of our associates who are growing game crops instead of timber crops. It has been our belief that greater progress can be realized through a unity of

effort between these two professional groups who both are trying to secure good use of the forest.

The Public—the Real Problem

It is often stated that any controversy arising as to the management of the deer and the forest could easily be solved from a technical approach. Were it not for the public, I believe this to be true. Such being the case, we must accept the fact that we have a problem of people management; by "the public" I refer to all people who aren't foresters or game managers. With this definition I will let you decide just who the minority group is, and just what the odds are of getting anything done at all.

The public's reaction to problems relating to game management is centered around three components, namely, tradition, sentiment, and emotionalism. Because of the strong grip which these three factors have in influencing human behavior, we who try to change long-established behavior patterns are due for some rebuffs, defeat, and a refresher course in applied psychology.

Perhaps foresters and game men are too prone to rely upon scientific facts to prove the arguments. Facts mean many things to many people. The general public seldom relies on a scientific approach or cold statistics as a means of reasoning. Such things are far removed from his every day living so why should he succumb to logic when it concerns matters of recreation and play time pursuits?

Traditionally, Wisconsin has long followed a buck season with a few exceptions in recent years. Tradition, therefore, strongly influences judgments which generalize that a buck season is the only logical season to have. Sentiment and emotionalism cause many hunters to look with disdain on a deer season in which fawns and does are declared legal game. It is, of course, unthinkable that anything but the male deer should be harvested. Yet

these same objectors will take other game whether it be birds, animals, or fish with no consideration of the sex ratio.

Because of the strong influences which tradition, sentiment, and emotions have exerted on the thinking processes of many people regarding the principles of deer management, I believe that "Bambi-ism" has become a dominant force in forming opinions by many people. "Bambi-ism" may be described simply as an emotional and sentimental substitute which replaces biological principles in a program of deer management.

We all know and are constantly reminded of the fact that the trained professional, be he forester, game biologist, or general land manager, doesn't know from nothing about this business of resource management. Fortunately for the welfare of our country, the "street corner experts" who are found in abundance can offer complete salvation and an effective panacea for the multitude of problems relating to the great out-of-doors and its complex problems of resource management.

We in Wisconsin are well aware of this voice of the public. So well aware, in fact, that some of the land-owning companies have issued special hunters' maps for their properties. This is done primarily to induce greater hunting pressure in some areas where the deer population is up and damage to forest reproduction is becoming critical. Although our company lands have always been open to hunting, it does seem that the maps have brought a closer tie with the hunter and have created a better understanding of the deer problem to others.

I believe that the solution to this problem relating to deer, trees, and people is the need of a complete understanding of the problem. We cannot just assume that the other fellow understands, we must make sure that he understands correctly.

Progress Report on the Mining Law

(From page 20)

tained yield management plan for this area. While making the determination of surface rights on this area, it was found that this claimant had given an option to a lumberman for the purchase of the timber on these claims as soon as they were patented. The claimant received \$5,000 for the

option. The option is of record in the county courthouse. To date, the Forest Service has examined 80 of the claims and requested hearings under Sec. 5(c) of Public Law 84-167. Our mineral examiner reported that the land embraced within these claims is non-mineral in character,

that minerals have not been found within the limits of the claim in sufficient quantity to constitute a valid discovery, and that Oregon law relating to the location of mining claims was not complied with.

One hearing on twenty of these claims was held in January 1959 and

the hearing examiner's decision was in favor of the United States. The hearing examiner stated: "From all the testimony presented at the hearing it appears that further exploration work will be necessary for a prudent man to determine whether a valuable mineral deposit exists within the boundaries of the claims and whether such a deposit, if any, warrants mining development. It necessarily follows that there has not been a discovery of a valuable mineral deposit on any of the claims in question. Accordingly, I declare that prior to patent the following mining claims are subject to the limitations and restrictions contained in Sec. 4 of the Act of July 23, 1955." The hearing examiner's decision was appealed to the director of the Bureau of Land Management. The director upheld the decision of the hearing examiner.

Technical examination of 250 claims is a time-consuming job, looking for discovery holes, sampling where possible, checking corner stakes, and other important points, but we plan to complete the work this summer. We are thankful that there are only a few such cases. We do, however, have several more on which over 200 claims are included in verified statements.

We have encountered problems and misunderstandings over reexamination of mining claims after the surface rights have been determined. Mineral examinations made in connection with surface right determination work under Public Law 84-167 are not always sufficiently detailed to meet the requirements of a patent application. From the technical mineral examination standpoint, which requires a satisfactory showing of mineral, they are the same. There are, however, other points, as you well know, that must be checked on an application for patent in addition to discovery. The \$500 expenditure for improvements, the posting of the application notice, the application of the 10-acre rule in regard to placers are a few of the additional items that must be checked.

An example of the need for reexamination was a 100-acre placer

claim for which the claimant filed a verified statement. Our mineral examiners found sufficient gold to justify the Forest Service to stipulate as to the validity of his asserted rights. About a year later the claimant applied for patent, and was told that we would have to reexamine his claim and apply the 10-acre rule. The reason—a single discovery will hold a placer claim, but when it goes to patent, each 10 acres must be mineral in character. The claimant was under the impression that the first examination under which we accepted his asserted rights was all that was needed for the Forest Service to clear-list his claim. This is not the case. Each patent application must be considered on its own merits.

Public Law 84-167 has not solved the problem of unauthorized use or occupancy of mining claims. Field examinations made in connection with the determination of surface rights indicate that there are over 2,000 cases of unauthorized use or occupancy. Most of this occupancy is of the summer home, hunting or fishing camp variety but occasionally we have found year-long residences. Some of these are hardship cases and create difficult problems.

Section 4(a) of Public Law 84-167 states that "Any mining claim hereafter located under the mining laws of the United States shall not be used, prior to issuance of patent therefor, for any purposes other than prospecting, mining, or processing operations and uses reasonably incident thereto." This provision has not been fully tested. Our next effort, after the determination of surface rights, will be to tackle the problem of unauthorized occupancy of mining claims.

A review of 11,000 mining claims covered by verified statements showed that two-fifths of them had been filed since 1950; nearly two-thirds since 1940; seven-eighths since 1920; and 97 per cent since 1900. Approximately 3 per cent, or 330 claims out of the 11,000 were filed before 1900, and only 22 had been filed between 1872 and 1879. In general, we are dealing with relatively recent claims.

We believe that Public Law 84-167 has brought the Forest Service and the mining industry into closer cooperation. We now have a better understanding of each other's problems.

In preparing multiple use management plans we are attempting to provide for coordination of the use of surface resources with your mining activities so as to avoid conflicts. We are fully aware of the requirements spelled out in Sec. 4(b) of Public Law 84-167 which says that "Any use of the surface of any such mining claim by the United States, its permittees or licensees, shall be such as not to endanger or materially interfere with prospecting, mining or processing operations or uses reasonably incident thereto." We are realistic enough to know there will be some disagreements as to what constitutes endangering or materially interfering with mining operations, but I believe these disagreements will be confined mostly to honest differences of opinion rather than misunderstandings of the meaning and intent of the law. These disagreements must be settled largely on the ground between the ranger and the miner. I am sure it is going to require a little give and take on the part of both and a good understanding of each other's responsibilities and rights under the law to avoid local squabbles.

The Forest Service believes in multiple use as a basic guiding principle. It has been time-tested since the creation of national forests. Mining has always been recognized as an important use of national forests. As population increases and more intensive use is made of all national resources, greater skill and more effort will be required to harmonize public use and the utilization of renewable resources with mining activities. We know the mining industry recognizes this and, as in the past, will sit down with us to resolve mutual problems. The effort will be rewarding because it will make possible the fullest practicable development of the national forests under a policy of wise use.

Forest Forum

(From page 3)

Strong for Multiple Use

EDITOR:

We have enjoyed AMERICAN FORESTS for a number of years and heartily approve your encouragement of multiple use of forest lands. It is nice to have a few pure wilder-

ness areas to see maybe once in a lifetime, but commercial and national forests, with camping privileges, seem to be the only logical answer to the growing move outdoors, as coupled with the need for 100 per cent use of all our natural resources. In this connection I particularly enjoyed

"A Congressman Takes to the Woods" in the December issue (maybe because Congressman Barr's views coincide so closely with my own).

U. A. Florin
687 Washington
Elmhurst, Illinois

(Continued on next page)

Forest Forum—Continued from page 75

For Less Federal Competition

EDITOR:

I have just finished reading the December issue of *AMERICAN FORESTS* and find it very interesting, especially for the small landowner. The many articles contain much useful information and is some of the best reporting I have ever read. Well written, too. This was the best issue ever.

Here's a thought that has nothing to do with the above, but I thought it a good chance to mention it: I deplore the trend toward more state and government expansion of tree nurseries with the increased competition with private nurseries. I am sure private business is more than willing to grow more seedlings if they are only given half a chance. But it is very hard to compete with your own tax dollar. Many nurseries in this area are being forced to cut back production due in large part to competition of state and federal nurseries. Looks like at present a large number of trees will be plowed under in the next year or so, due to lack of sales.

I do know it will hustle us to sell all we have available and we can sell in large quantities for as low as \$8.50 per thousand. Nevertheless, we will keep plugging despite government competition.

Gordon McCurdy
McCurdy Nurseries
Manton, Michigan

Forestry Bank Makes Gains

MR. HORNADAY:

... I want to thank you and your staff for the wonderful way you reported your visit to Mississippi. I am extremely flattered that you should devote so much space to my discussion of our forestry bank. I hope our record will live up to this publicity...

As a matter of information, four banks in Mississippi have now agreed to participate in the program and provide funds for trees and TSL, with the amount to be insured by the Forestry Bank. As you can imagine, this is the area in financing which we want to stimulate as much as possible—and it appears we may be more successful than we had hoped.

James A. Files
Vice President
First Fed. Savings & Loan Assn.
Jackson 5, Mississippi

Forestry Under Free Enterprise

DR. COMPTON:

I was recently fortunate enough to have time to read your article, "Forestry Under a Free Enterprise System," published in the August, 1960, issue of *AMERICAN FORESTS*. This is the most understanding exposition I have read on the development of forestry in our country. You have done a very great service both to the profession of forestry and to the private enterprise system.

Howard A. Post
Forest Resources Assistant
Natural Resources Department
Chamber of Commerce of the U. S.
Washington 6, D. C.

More Emphasis on Private Forestry Urged

EDITOR:

May I have the pleasure of complimenting the association for a very fine magazine? May I also offer the following suggestions: 1) Why not publish a list of all state and county foresters and their addresses to help direct woodland owners to

sources of aid; 2) Publish more articles on the small, independent woodlot from the point of view of people—and how they and products of the woodlot fit into the economy; 3) Put more emphasis on the national Forest Service and the Interior Department on owning less land. The future of forestry rests with the individual and groups of individuals; and 4) Drive for more advertising from firms relating to the forests and the wood products industries. . . .

Charles B. Lewis
1109 N. Wheaton Avenue
Wheaton, Illinois

Turpentine and Trees

EDITOR:

I have read with a great deal of interest two articles in the December issue of *AMERICAN FORESTS*, the first by Mr. Kenneth B. Pomeroy entitled "Time to Pull A New Streak," and the second, "Trees—A Growing Investment Opportunity," by Dr. Ivan R. Martin, Extension Forester, Auburn, Alabama. We have permission to reproduce these two articles in full in our *AT-FA Journal*!

Downing Musgrove
Assistant Manager
Amer. Turpentine Farmers Assn.
Valdosta, Georgia

(*American Forests* is always happy to have other journals reproduce articles published.—Editor)

Profile of a Year

EDITOR:

I must let you know, even this late, that I was delighted with the way you handled my article in the September issue ("Profile of a Year—1910"). You gave it the full treatment; the photographs and cartoons made the article look better than it was. Where did you get them, by the way? . . .

After looking back over your long letter of last April, I must admit you are a better political prophet than I; you said the times called for a "strong" man, one in the mold of the late T. R. I think we have one, and would have had one if the election had tipped the other way.

A. L. Bennett
Department of English
The A. and M. College of Texas
College Station, Texas

Correction

We would like to invite the attention of readers to a serious error in the January issue of *AMERICAN FORESTS* on page 6 in the first installment of the article "Your Investments in Land and Water." We refer to the first line of the caption under the picture at the bottom of the page which reads, "Range seeding averages from \$50 to \$80 an acre." This caption should have read "Range seeding averages from \$5 to \$8 an acre." We would like to add that this is an *AMERICAN FORESTS* error and that no agency of the federal government is responsible for it.—Editor

(Yes, the two candidates who emerged were both good men although the campaign itself was not as hard fought as many would have liked. For the benefit of other historical writers as well as Author Bennett, the cartoons and other photographs for his article came from the Library of Congress, which is a treasure trove of valuable historical information. So well catalogued in the library's reference material that only one day was required to dig out the pictures for this particular article. *AFA* itself is rather well loaded with this type of material, by the way.—Editor)

More About Holly

EDITOR:

In the December issue of *AMERICAN FORESTS*, the editorial "The Man from Holly Hollow" was of particular interest to me. I am interested in starting a patch of holly which would be suitable for use as Christmas type decorations and other purposes. It would, of necessity, have to be a species, type, or strain which bears berries liberally and which is a coniferous or evergreen variety. Any additional help or information on this subject will be appreciated.

M. E. Reigart
Materials Supervisor
York Caskets
York, Penna.

(In reply to Mr. Reigart and others who have requested more information on holly, we suggest they write directly to either the American Horticultural Society, 1600 Bladensburg Road N.W., Washington 2, D. C., or Mr. Harry Dengler, Extension Forester, University of Maryland, College Park, Md. Mr. Dengler especially is a walking encyclopedia on holly.—Editor)

Pollution Follow Up

EDITOR:

I had planned to attend the National Conference on Water Pollution but other unexpected meetings (not the weather) prevented me from attending, but two of my associates, Senator Raymond B. Phillips and our director, Peter J. Short, Jr., attended in my stead and reported quite fully on everything that transpired at this meeting.

However, the most satisfactory and the best condensed reports of this meeting were in the articles in the January 1961 issue of the *AMERICAN FORESTS*. At our regular meeting of the Public Health and Welfare Committee of the Delaware State Chamber of Commerce, I read many paragraphs of this article in reporting on this conference. I want to thank you and congratulate you on this type of reporting of the very important meeting.

There are no good reasons for restricting my comments to this particular section of your publication, except I just returned from the Public Health and Welfare Committee meeting, for the other articles in this issue of *AMERICAN FORESTS* are equally well prepared and written. Of course you know I'm partial to photographs and they have added a lot of interest to this issue. Furthermore, the graphs on pages eight and nine were rendered far more attractive and interesting by giving them a colored background.

I am writing you this now to convey that which I expect to express to you personally in the near future, namely, my appreciation for the wonderful contribution that you have made to the conservation needs of our country.

Clayton M. Hoff
Executive Vice President
Brandywine Valley Assoc.
Wilmington, Delaware



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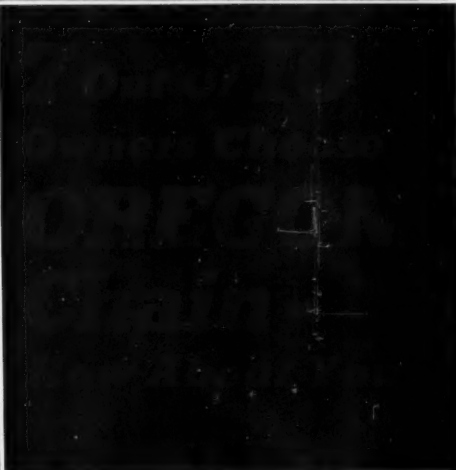
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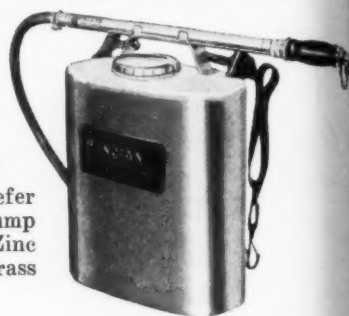
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